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"Let There Be Sight"

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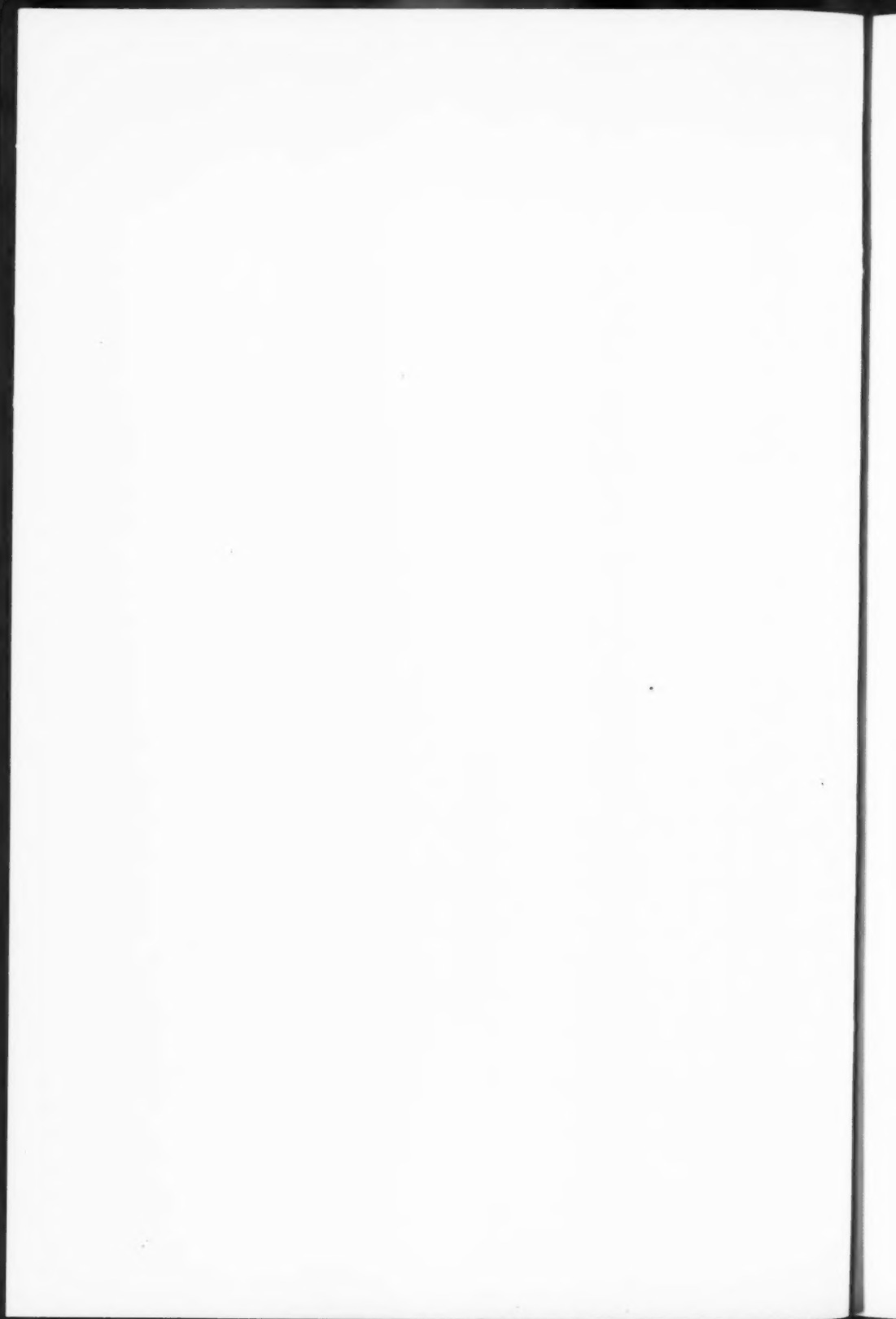
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Helping America by Saving Sight in Childhood—Through Child Welfare Services*

Helen C. Hubbell

THE author describes the sight conservation activities of the Child Welfare Service in Pennsylvania, under the Social Security Act.

IN A PAPER having to do with saving sight it may be permissible to present the "vision" difficulties which have been a part of the development of Child Welfare Services in Pennsylvania, and to see how these are related to the problem of impaired vision in individual children. The needs of all children call for sensitivity and imagination in those individuals who seek to give help; by the same token a program established in the name of service to children needs to be rooted in sensitivity and imagination, and in addition to have a clear-eyed vision as to what its focus shall be.

As this group is undoubtedly familiar with the section of the Social Security Act (Title V, Section 521) under which Child Welfare Services are available for every state, the only emphasis needed is a reminder that there is no general program for the country as a whole, but instead the freedom to work out with the United States Children's Bureau a plan best suited to the situation in each state.

A component of this freedom seems to me to be a responsibility to focus on services to children in terms of: (1) the greatest need in a particular state; and (2) the framework of government in the state within which the need can be met, since this is a public program. It is around this matter of focus that our program has had "vision" difficulties which have a direct bearing on what Child

* Presented at the National Conference of Social Work, June 2, 1941.

Welfare Services have meant to particular children with partial sight.

The group of children we saw clearly as needing our program were those in rural counties and areas of special need, who have to be cared for away from their own homes and whose maintenance (board, clothing and medical care) are the responsibility of the three County Commissioners, local public officials elected every four years. Therefore, we have used the federal money to place social workers with training and experience in those counties which would accept them and in which there was no child-caring agency with professionally trained staff. At the present time there are 19 such counties, 16 of them 50 per cent rural or more, and three considered as "areas of special need."

Therefore, on one bright morning a county child welfare secretary finds herself in an office in the Court House getting acquainted with her three "bosses" who may be graduates of the eighth grade or of a university—who may be men with business experience or the "professional" politician whose concept of public service is to be reelected every four years for the rest of his life on a platform of economy and reduced taxation. This is not facetiousness but a reality which affects the social vision of the Child Welfare Secretary, which in turn may mean physical vision or lack of it for an individual child.

The Child Welfare Secretary begins with a case load of children which at this point are a list of names on the county comptroller's book. We speak of these as an "inherited" case load, inherited from the days when the public officials did their own placing; they have been placed with people who would take them for the least amount or possibly free, which usually means that the child pays for himself through exploitation of either himself as a person or through his work-worth to the family; they may be in children's homes outside the county with no visits for years; they may be in institutions for the handicapped, including the blind, which may explain why there are partially sighted children in state institutions for the blind. In this inherited case load the outstanding characteristic is a lack of focus on the needs of each child which has meant a haphazard placement with the emphasis on money.

Our focus has been on the group of children in terms of finding

out where they are, why they are there, and what new plan should be made. Taking the three counties in which we have given the most help with partially sighted children, Fayette, Indiana, and Washington, the beginning case loads were 74, 48, and 64 respectively.

While the workers in these counties were in the process of discovering these "forgotten" children, there began a series of conferences on the state level between the Council for the Blind and the Rural Child Welfare Unit which is the administrative unit for Child Welfare Services on the state level, and both the Council and the Unit are Divisions of the State Department of Welfare.

In December, 1938, the Council asked for assistance from the Unit with these groups of children:

"(1) The first group consisted of blind children of preschool age for whom aid was needed, either through the education of the family to the end that the child might be brought up as normally as possible at home, or in the case of children whose home conditions were unfavorable, their referral for possible admission to the Arthur Sunshine Home and Nursery School for the Blind, Summit, New Jersey.

"(2) The second group was made up of blind children of school age whose mental capacity would not permit them to fit into the program of academic instruction at our two schools for the blind, but for whom habit training and the teaching of handwork might make life a much more comfortable and acceptable thing in later years, both for the children and for their families or those with whom they may live.

"(3) The third group was made up of children whose vision was above the level of blindness but below that which would permit their education under a plan set up for normally sighted children. In this group also were children suffering from conditions which if untreated might lead to later blindness."

This raised a problem with the Unit which is ever present; namely, what is the function of Child Welfare Services, and does help to these three groups of children come within it. From what has been said before about "inherited" case loads and "forgotten" children it is clear that the placement and supervision of children already in the care of the county was our first responsibility. We included also the study of family situations referred because of the conditions in the home and the question as to whether case work

with the family might help maintain the home. Therefore, the case loads in all three counties included both groups, but the chief emphasis was on the children away from home.

Granted that a child away from his home represents to some degree the failure of the community to provide a service which will strengthen family relationships and develop parent responsibility, once the children are placed, the agency responsible for their supervision *assumes, as it seems to me, a degree of responsibility which is greater than anything in the profession of social work.* Child placing involves separation from own parents, with all that means to the child and his parents, and the providing of a new experience in family life for the *child as a whole person.* A harassed, burdened, and often hectic child welfare worker brings little help to a fearful child living through a new experience, and unless she is secure in the knowledge of what her agency can and cannot offer, there is little security for the children for whom her agency takes responsibility. This is a fundamental conviction of the Rural Child Welfare Unit and out of this went the following statement to the Council for the Blind:

"It seems to me that the first and second groups of children given in your memorandum call for a program of care based on their handicap, whether they are in their own homes or elsewhere, and I see no place in our program for planning for these children as a *group.* However, in any of the counties where Child Welfare Services are established, should an individual child belonging to either of these two groups *need care away from his own home* as a neglected and dependent child, and a foster home would seem a helpful plan, such a child should be referred to the County Secretary for her decision as to whether she could take him into care. In such instances, I would assume the help in education needed by both child and foster mother would be secured through the Council for the Blind.

"In relation to the third group, I think I feel a little more responsible as their handicap is not enough to place them in the regular program for the blind. Here again, however, I think our criterion has to be whether or not the child needs care away from his own home. In the counties where we have Child Welfare Services I believe any child who might be helped by a foster home placement either because of his family setting or for an opportunity for better education or training should be referred to the County Secretary.

"My thinking is that our program can bring help to children who

are blind or whose vision 'is below that which would permit their education under a plan set up for normally sighted children' only if what we have to offer, namely thoughtful and planful care away from their own homes, is something the child can use in working out his acceptance of himself with his handicap or when our care would mean opportunity for special education or for medical and health care. It seems to me that there might be more children in group three who could use our service, than in group one and two."

This statement was accepted by the Council. Prior to this defining of a relationship between the two agencies on the state level, the Council and the Unit, there had already been some work on cases in two of the counties.

In Fayette, Cecil was referred to Child Welfare Services with the request that he be visited at the George Junior Republic to see if he was receiving the right kind of education for his visual handicap. At this time Cecil was fourteen with an I.Q. of 79. An ophthalmological examination on July 30, 1936, showed "more vision than would require his education at a school for the blind." Glasses were secured. Cecil had been in institutions all of his life and he had been sent to the George Junior Republic because he was too much of a behavior problem to remain at the Western Pennsylvania School for the Blind. With the opening of Child Welfare Services in this county in December, 1936, it was hoped that Cecil might be removed from the George Junior Republic and placed in a foster home in Pittsburgh, with support from Fayette County, in order to attend a sight-saving class, and possibly go to the Child Guidance Clinic there. Change in workers and many problems of administration crowded Cecil out. Foster home finding for children with handicaps of behavior or sight, or both, was difficult, and impossible in Cecil's case at that stage of development of the Child Welfare Services program. An appeal to a child placing agency in a large city was unsuccessful and Cecil was removed from the George Junior Republic to the Torrence State Hospital for observation on January 7, 1939, and is still there.

This raises the question of whether Child Welfare Services in this particular county had anything to offer at the time Cecil needed our kind of help and whether there was anything real in our promise to help.

In Indiana County, where Child Welfare Services began in May,

1937, the case of Angelo M. was referred to the Child Welfare Secretary:

Angelo, a fifteen-year-old boy living with his father in a taproom, was excluded from a township school because he was too "mentally handicapped for education in the public schools" (statement of School Board). In July, 1935, he had been examined by the psychologist from the Bureau of Mental Health in the Department of Welfare and found to be an "Albino with defective vision." This psychologist asked the Child Welfare Secretary to help Angelo's family with plans for his training. A part of the problem was Angelo's unwillingness to wear his glasses regularly and the father's lack of interest in helping with this. The Child Welfare Secretary reported no need for foster home placement because of the family situation and no sight-saving classes in the county. She asked for suggestions as to an institution where he "could be trained to save his vision and where he could be instructed vocationally." She agreed to visit and try to keep track of the glasses situation, as she found them broken on her visit to the home. The Council's reply to this was a suggestion that Angelo remain in his home with application made for his admission to Polk State Institution for the feeble-minded, since his I. Q. of 62 did not justify placement in another county where a sight-saving class would be available. Plans were made for Angelo's commitment to the state institution for the feeble-minded and an attempt made to secure the father's signature. This was unsuccessful and the father asked the Child Welfare Secretary "to drop everything." This was reported to the Bureau of Mental Health, but not to the Council for the Blind.

These two situations were handled through correspondence between the Council for the Blind and the Child Welfare Secretary. About this time, Mrs. English of the Council began having conferences with the field supervisor of the counties to which cases were being referred and carbons of letters to the counties were exchanged between the Council and the Unit.

In June, 1938, the Council invited the Supervisor of the Unit to speak to a group of four workers who had just completed a semester's training course in Medical Social Eye Work at Washington University, St. Louis. Each of these workers was to go into a county to develop a program for the prevention of blindness. Three other workers already in counties were there too. The meet-

ing gave an opportunity to present the program of child care—or lack of one—in each of these seven counties. In November of the same year, the director of the Council spoke at a staff meeting of the Child Welfare Secretaries from the nine counties in which the program was established. Points emphasized included:

- (1) The Council's need to know of people with impaired vision so that treatment may be secured in time to prevent blindness;
- (2) The need to know the various causes of blindness for the purpose of study and research;
- (3) The special importance of discovering preschool children with vision difficulties so as to secure treatment and training;
- (4) The use of qualified ophthalmologist with which the Council can give definite help.

About this same time the Council prepared the statement for the Unit which described:

- (1) Recommendation to use an ophthalmologist if possible, and as a second choice an eye, ear, nose and throat physician;
- (2) The types of defective vision which can be corrected with glasses;
- (3) A definition of the partially seeing child;
- (4) The acute eye conditions in children which may lead to blindness;
- (5) The definition of a blind child;
- (6) Special problems of the preschool blind child;
- (7) A description of sight-saving class equipment.

Attached was a list by counties of certified ophthalmologists. This material was sent to all the counties, and became a part of the "travelling kit" of each field supervisor (sample of material available).

At this point it is interesting to see whether the working relationship that has been developing between the Council for the Blind, and the Rural Child Welfare Unit (both on the state level) has brought help to an individual child. You will remember that the Unit felt that Child Welfare Services might be most helpful to the group of children "whose vision was above the level of blindness, but below that which would permit their education under a plan set up for normally sighted children, and also those children suffering from conditions which, if untreated, might lead to later

blindness." First of all, there might be some of these children already in a county's case load and planning for these children with the help of the material furnished and the consultation service available to our field supervisors from the Council, would mean planning for these children on the basis of knowledge and special understanding. The emphasis on the use of a qualified ophthalmologist alone would give the county worker strength to demand this from the local public official, even at greater cost to the county; failing in that she would appeal to her committee of local citizens for special funds. It would be clear to the worker too that placement away from home, with the co-operation of the parents, would come within the function of the Services, even though it was to be made on the basis of a physical handicap. Her own "near-sightedness" in thinking of placement in terms of neglect and dependency would be helped. At least she would think through carefully whether or not she could take in this added responsibility without neglect of the children already in care, who are her first responsibility. She would have an experience in learning the resources for such children for medical treatment, the right kind of psychological examination and opportunities for education and training. It is of help to a county worker, beset with heavy case load and referrals that often bear no relation to the service which her agency has to offer, to know that procedures have been established on the state level between her "heads" and those of the agency (in this case, the Council for the Blind) from which comes a request for additional work.

She knows that the Unit follows the volume of work in each county through monthly statistics; that there is an attempt to define Child Welfare Services in each county; that there is an attempt to meet increasing volume with an increase in staff; that she is asked to help with plans for a blind or partially-sighted child because she has a definite contribution to make to such a child.

These points are borne out in the following case in Washington County:

In March, 1938, Gloria C., aged 8, was referred by a private agency to the Council because of keratitis and the need of treatment for syphilis. With the help of the state nurse tests were made showing a 4 plus Wassermann, and the family was

advised to take Gloria to the clinic for treatment. This presented a financial problem to the family and there was some question of referral of the case to the County Commissioners for cost of transportation and treatment. At this point a friend volunteered transportation and the local eye physician took some responsibility for following along with the program of the treatment. In April Child Welfare Service began and the case was discussed by Mrs. English of the Council with the field supervisor for that county, and later by her with the Child Welfare Secretary. A visit was made to the home and Gloria was found to be improved. This family proved to be adequate so there was no need of placement. Inquiry of the physician brought the recommendation for treatment to continue for twelve to eighteen months longer. In conference with the field supervisor it was decided that the Child Welfare Secretary would continue to visit Gloria to see that treatment continued and to follow through with school placement which might require sight-saving equipment as there was no sight-saving class in the county. Gloria showed sufficient improvement to attend the regular school and except for special seating no other adjustment has been used.

The Child Welfare Secretary has done nothing spectacular in this case, but it is significant to me as Supervisor of the Unit on two counts: (1) real responsibility was taken for accepting this child as a part of the worker's case load which meant a following through as a part of her regular job; and (2) the plan of the field supervisor in helping her accept that responsibility due, I believe, to the understanding relationship between the two agencies on the state level. This working relationship is not static and should develop and change as both agencies have experience with what has already been developed.

Writing this paper has raised for me further points in our relationship which need to be clarified. However, there is a sense of direction in our work with the Council and I believe that this reaches through to the workers in the counties and helps them take responsibility for having a "sense of direction" in their work with individual children.

At this point, I would like to express the Unit's appreciation to the Council for initiating conferences through which our respective programs might be clarified and procedure for a working relation-

ship developed. A new public program for children and one financed by federal funds has many birth pangs, chief of which is the pain of defining its service. The general concept of public service means coverage, unlimited case loads, and insufficient staff. This may be a public agency, but it is not a child-caring agency in its real meaning. Taking children into care and under supervision can and does, in some instances, mean nothing better for the children, unless there is a defining of service and a sense of direction in each responsibility undertaken. Without this it is a kind of activity which makes us seem better than we really are. The experience of the Unit with the Council challenges us not to do all that is asked of us, but to select what is within our power and skill to give, and to do what is undertaken with the kind of responsibility which may make the difference between sight and blindness for an individual child.

With a developing relationship between the Council and the Unit we are increasingly aware that the Council's service is a specialized one in which we can share with safety to the children involved, in proportion to our own increasing knowledge in that field. We have had to learn how essential it is to use accredited ophthalmologists for all our children and this in itself may have saved the sight of children already in our care. We have learned how to work with teachers in providing sight-saving equipment and even in the simple matter of right seating for children with partial sight. This sharing in a specialized knowledge and experience is of value to all of the county workers whether they have yet had a particular child for whom they had to plan in terms of sight-saving. Since this kind of knowledge has more meaning when related to a particular child, we welcome the experience of using it for those children referred to us by the Council.

It is interesting that none of the six counties in which there is a prevention of blindness worker is there a program of Child Welfare Service, which suggests that we shall continue to be asked to give our help on cases.

In closing, I should like to emphasize the value in having the Council and Unit working together through exchange of memoranda and through conferences between field staff. Against this as a background, the Child Welfare Secretary in each county can

decide what her agency can offer in individual cases referred by the Council. She has to measure the degree of responsibility she can assume in relation to the function of her agency and the volume of work already undertaken. She has the responsibility for adequate budget, which should include provision for proper lighting facilities as well as correct and adequate nutrition. Today, more than ever, the vital importance of nutrition in creating and maintaining eye health is recognized. In any case she has a clearer understanding of the eye needs of all children and of the specialized needs of those children whose vision must be conserved.

The questions of interest to the group might be: (1) How to make sure that all the children in the care of Child Welfare Services receive adequate eye examinations and care; (2) Should we respond to all referrals from the Council no matter how hard pressed with our own job? (3) Is our program in rural counties the answer to the needs of children needing care and sight-saving provisions at home and at school? What is the goal for these children and whose responsibility is it to achieve that goal?

Helping America by Saving Sight in Childhood—Through Educational Service*

Winifred Hathaway

THE relation of social work to the sight-saving class program is described in this article, which presents three case histories describing the important role of the social service worker.

IN A RECENT issue of the *Reader's Digest* the story is told of a little negro boy taking part in a race, but so far behind the others that there seemed little hope of his ever reaching the finishing line. Suddenly, however, he seemed to take a spurt and speeded up so rapidly that he crossed the line first. Bystanders noticed that his lips kept moving and asked him what he had been saying. "I was just a-prayin', 'O, Lord, you pick 'em up and I'll put 'em down; you pick 'em up and I'll put 'em down!'" Was there ever a more direct or a more efficient prayer? You do your part and I'll do mine. This is education—all those concerned in the welfare of the child doing their part so thoroughly that he is enabled to do his part equally well, and thus, through a co-operative effort, develop his innate powers to the full extent of their possibilities.

Modern education is founded on the proposition that the child is ready for the school and the school is ready for the child. How far this proposition is still theoretical rather than practical is shown by the many problems found in the schools of today. The school is more and more realizing that the child is not ready to take advantage of educational opportunities offered and is, therefore, reaching out to the preschool child.

But if the educational proposition, that the child is ready for the school, is to become an actuality, it is necessary to reach much

* Presented at the National Conference of Social Work, June 2, 1941.

further back. The social worker is one of the key people in this undertaking and must, therefore, assume a full share of the responsibility for premarital laws, prenatal, natal, postnatal and preschool care. If she carries out this program adequately, she has the right to ask of education the fulfillment of the second part of the proposition—that the school be ready for the child.

In order, however, to be able to do this intelligently, she must know present conditions and be able to give all possible assistance coming within her province toward solving the problems created by these conditions. She must, moreover, be in position to know what are the correct conditions toward which the school should strive, always bearing in mind, however, that an ideal is never static, but moves forward as new knowledge becomes available.

Importance of Vision in Education

It has long been recognized that impressions from the world outside the child reach his inner consciousness through his senses and that, of these, the sense of sight carries to the brain a far larger proportion of impressions than do all of the other senses combined. Modern education accentuates this use of the power of seeing. More close use of the eyes is required by the educational program of today than ever before. Other things being equal, any child who would compete with his fellows must either have as good sight as they, or must be given, in some form, compensation for his lack.

Responsibilities of the School System

In the schools of today, so far as vision is concerned, four groups of children must be considered:

1. Children with normal vision. The responsibility of the school system for this group is to make every effort to keep the vision normal through attention to general health and eye hygiene and to the correct physical equipment of the classroom, including correct lighting, seating, ventilation and the use of well printed textbooks.
2. Children with defects of vision that may be compensated for with glasses or diseases of the eye that may be successfully healed. Here the responsibility must, of course, include the benefits provided for the first group and, in addition, co-operation with the

parents in having the necessary correction or treatment that will bring the child's vision as near to normal as possible.

3. Children with serious eye difficulties who, after proper refraction and treatment, cannot be profitably educated in the regular grade.

4. Children who are blind or who have so little sight that their educational approach must be made through other senses, chiefly those of touch and hearing.

In addition to the care taken for the first two groups, special equipment and educational media suited to their needs must be provided for those in the third and fourth groups.

Responsibilities of the Social Worker

The social worker comes in contact with some of the individuals making up each of these groups. With those of the first group she has the opportunity, through home visits and through contact arising in clinics to which children may be brought because of conditions affecting general health, to stress eye care and protection, through attention to diet, prevention of accidents at play or in sports, and care of the eyes during the onslaught and particularly during the convalescent period of diseases of childhood—measles, whooping cough, etc.

The contact of the social worker with individuals of the second group is almost constant. There is the necessity for treatment of minor eye difficulties—sties, blepharitis, conjunctivitis, etc.—and for examination for refractive errors. The problem of obtaining glasses to compensate for these is ever with her. The emphasis on returning for reexamination or check and the follow-through are likewise parts of her job. What a social worker can accomplish in co-operation with others is demonstrated by Dr. Imus,* of the Dartmouth Eye Institute, in the following case:

An 11-year-old boy in the seventh grade was not only having difficulty in reading but also presented an extreme behavior problem in school. On the latter account, a social worker was assigned to co-operate with the teachers and the family in an attempt to correct his emotional maladjustment. In reading, the child would lose his place, skip lines, or read the same line

* Imus, Henry A., "Visual Efficiency," appearing in the April and May, 1941, issues of *Hygeia*.

twice; the words would become blurred. After an hour of study, his eyes would itch and burn, and he would feel sleepy. An eye examination revealed a moderate amount of farsighted astigmatism and aniseikonia (unequal images in the two eyes). Following the proper correction of these disorders, he made a gradual improvement. Six months later his mother reported that, for the first time, he was enjoying his school work, and that his report card showed no failures and some A's and B's. She also stated that the improvement in his general behavior was as striking. There is no doubt that, in this case, the correction of the ocular condition helped to transform this child into a better integrated personality and a socially acceptable person.

The social worker's closest contact, however, is with the third group, made up of the partially seeing whose serious eye conditions not only call for continuous eye care, and attention to diseases of the body that may be the real cause of the eye difficulty, but also to the effect of home conditions on the physical and emotional life of the child. Maladjustment arising directly or indirectly from the handicap is a problem, the solution of which faces every social worker. In order to help in solving this, a social worker must understand some of the reactions that might be expected from refractive errors and other eye difficulties. A highly myopic child may develop a non-social attitude. If his difficulty is uncorrected, his focal distance is short; he cannot recognize things or persons beyond this point; hence, he tends to become interested only in nearby objects. This may result in his being self-centered and egotistic. The wise social worker will make every effort to widen his horizon by seeing that his difficulty is corrected and by interesting him in outdoor games that he can undertake.

The hyperopic child sees things better at a distance than those at close range. Eye tasks often prove irksome to him. His attention span is short, and if forced to do close eye work for any length of time he may become irritated and may even have tantrums. Again, correction is indicated and it may be necessary for a social worker to explain to the teacher why a considerable amount of oral work should be a part of his program.

The child with uncorrected astigmatism is under a constant strain because the ciliary muscle is trying to focus a clear image.

What the social worker may do in such case is indicated by the story of Anne:*

Anne attended a private school of high standing. The teacher found that she had good background and experience, did excellent oral work, but was an exceedingly poor reader. The eye test indicated the need for a thorough ophthalmological examination and word to that effect was sent home to the parents. Although they were well educated people with ample means for good medical care, they did nothing and there was no follow-through on the part of the school.

The next year the eye test showed a worse condition although, curiously enough, Anne's reading had improved considerably and some of her nervousness had disappeared. Again notice was sent home with the former results. A friend of the family, a trained medical social worker, was visiting the home and noticed that Anne was using only one eye in reading. She inquired about school records. Anne's mother told of the notices that had come two years in succession but stated that the child was so busy with extra-mural activities—dancing, swimming, tennis, etc.—that there had not been time for medical attention. The medical social worker tactfully arranged matters.

A muscle imbalance was suspected, but it was found that one of Anne's eyes was so highly astigmatic that practically all letters blurred beyond recognition. Since the brain could not fuse the clear image from the good eye and the blurred image from the poor one, the latter gave up trying to function. Naturally, when only the clear image from the good eye was received, Anne's reading improved, but at the cost of a practically useless eye, and a loss in fusion and depth perception! Following the thorough medical examination it was possible to compensate for the astigmatism with glasses, but a long period of training was necessary to re-educate the astigmatic eye to work at all and then to work in co-operation with its fellow. The good eye had to be occluded in order to make the other assume its share of the seeing process.

The child with such seemingly insignificant difficulties as sties or blepharitis may be suffering from malnutrition, lack of sleep or refractive errors and may be listless, uninterested in school work and given to fits of crying. The social worker cannot hope to

* Hathaway, "Sharing Responsibility for Eye Health," *The Elementary English Review*, December, 1940.

effect an adjustment until the cause of the difficulty is found and eliminated.

The case of Esmeralda indicates what may be accomplished by the co-operation of teacher and social worker where both are vitally interested in the welfare of the child.*

Esmeralda was a mirror writer and reader. Just as in taking a photograph the image is upside down on the film or plate and must be developed to bring it right side up, so the image on the retina, the picture-making film of the eye, is upside down and must, through some process of the brain, be reversed to its correct position. If this power is lacking in the brain little can be done; if it is present and its function is being interfered with by various influences, much can usually be accomplished. But what these influences are must be determined.

Although for Esmeralda's teacher, mirror reading and writing were new experiences, she accepted her responsibility and made every effort to find out why the child held her book upside down and read from right to left and why she followed the same procedure in writing. An eye test showed no eye difficulty but the teacher realized that the child was in exceedingly rundown physical condition and was very nervous. Visits to the home showed that Esmeralda lived in an atmosphere of continued fear and apprehension because of the brutality of her father when he was intoxicated, and this was usually the case.

The teacher immediately got in touch with a social agency equipped to take care of this problem. A thorough medical examination was arranged for and the suggestions of the doctors followed. A foster home was found for Esmeralda; her general health was built up through proper food and rest, and with the removal of the fear element, much of the child's nervousness disappeared. The teacher gave individual attention to her reading difficulties and gradually the child began to hold the book in the correct position. With the book right side up, the change in reading from left to right was made without too great effort. The writing problem was somewhat more difficult of solution; the change came very gradually and for some time if Esmeralda was hurried or flustered, she reverted to mirror writing.

With the building up of the physical condition and with infinite patience on the part of the teacher, at the end of a two-year period the difficulty had entirely disappeared.

* *Ibid.*

In this case the teacher, realizing that there were problems connected with the reading difficulty that did not come within her province, acted as a contact between the family and the social agency equipped to undertake the necessary adjustment. By both assuming their share of the responsibility, they were influential in changing the child's life.

Education of the Partially Seeing

To the ophthalmologist belongs the responsibility for diagnosis and treatment of eye difficulties, but usually he has the added responsibility of recommending educational procedures and all too often a recommendation is made that a child be kept out of school because the ophthalmologist is unfamiliar with any form of special education that might be available in his community. If under such circumstances the social worker is able to acquaint him with the resources of the community for special education of the partially seeing, she will be serving not only the child but the community. If, on the other hand, no educational opportunities for such children are available in the community, she may bring the needs to the attention of the educational authorities and so, again, serve the child and the community.

In order to fulfil either of these obligations, the social worker must have a basic knowledge of the extent of the problem and the best methods of solving it.

Extent of the Problem

The number of partially seeing children (those having such serious eye conditions that special educational procedures are necessary) is comparatively small. The most conservative estimate is one in a thousand of the school population, although the results of practical experience indicate the ratio to be much nearer one in five hundred.

Partially seeing children come under the following classifications:*

1. Children having a visual acuity between 20/70 and 20/200 in the better eye, after refraction.

* Hathaway and McIntire, "Sight-Saving Classes: Organization and Administration," Publication 30, rev. 1937, National Society for the Prevention of Blindness, 1790 Broadway, New York, N. Y.

2. Children with progressive eye difficulties.
3. Children suffering from non-communicable diseases of the eye or diseases of the body that seriously affect vision.

During the past decade much attention has been given to the effect of eye difficulties on educational processes and to the psychological reactions of physical disabilities. As a result, it is well to consider the placement in a sight-saving class of the following three other groups of children as a temporary measure:

1. Children who have had eye operations (particularly enucleation) as a result of which re-adaptation in eye use or psychological readjustment is necessary.
2. Children who are suffering from muscle anomalies requiring re-education of the deviating eye in cases in which an untoward psychological reaction is manifested.
3. Children recovering from diseases such as measles, who need special eye care until they are able to assume the full responsibility of regular grade work.

Perhaps the best summary is, "Any child of normal mentality who, in the opinion of the ophthalmologist, needs the special care, equipment and educational media offered by sight-saving classes, should be considered a candidate."

Solution of the Problem

The best method yet devised for the education of such children is the establishment, in school systems, of special classes known as sight-saving or sight conservation classes. A community having approximately 10,000 pupils enrolled in the school system will, in all probability, have enough partially seeing children to warrant the establishment of a special class for them. There are now in the United States, 627 sight-saving classes in 220 cities, representing 28 states, the District of Columbia and the Territory of Hawaii. It is estimated that 40,000 additional boys and girls in the United States still need the facilities for special education.

The trend in modern education is against segregation; hence sight-saving classes are established on a co-operative or co-ordinating basis. The partially seeing child does all his school work requiring close use of the eyes in a specially equipped room under the direction of a teacher trained to understand his difficulties and to adapt

material to his eye needs. He carries on all other activities with his normally seeing companions.

Physical Set-Up of Sight-Saving Classrooms

Seeing is a complicated process involving the functioning of many factors, chiefly the eye through which to see, the light by which to see and the brain to interpret the message. Since in this group of children it is recognized that the eyes are unable to carry their full share of the load, it is essential, in the physical set-up, that special attention be paid to illumination.

For normally seeing eyes, a minimum of 15 foot-candles of illumination (units of light) is recommended. For eyes that deviate from the normal to any marked degree, the recommendation is double this minimum.* However, quality of illumination is an even more important factor than quantity. Light should be well diffused, well distributed, well directed and without glare. Many factors contribute to bringing about desirable results: orientation of the room, depending upon climatic conditions, unilateral natural lighting from the left of the pupils (since the great majority of children are right-handed), with special seating arrangements for the left-handed child. If bilateral lighting is desired or necessary, windows should be at the left and rear, those at the rear being placed at such a distance from the floor that children will not be sitting in their own shadows. The glass area should be at least twenty per cent of the floor area and should reach as near to the ceiling as possible, since the best light comes from the top.

Natural illumination should be adequately controlled by two translucent shades of soft-finished material, placed at or near the center of the window, one pulling up and the other down, with a protective device to prevent streaks of light from entering between rollers. Shades should be wide enough so that light will not enter at the sides.

Artificial illumination for dark days is as essential as good natural lighting. Luminaires should be selected with great care. Indirect fixtures, diffusing the light thrown on the ceiling, give com-

* Illuminating Engineering Society and the American Institute of Architects, "American Recommended Practice of School Lighting," New York, N. Y., 51 Madison Avenue, 1938. 60 p. 25 cts.

fortable results for seeing. Plastic bowls as nearly white as possible are sometimes preferred, for although the source of light is not visible, there is a luminous effect which is thought to aid psychologically. It is economical to place luminaires on separate switches with possibly higher wattage lamps in the row away from the windows.

In order to obtain the best results from illumination, ceilings should be white; upper walls should be light, giving above 50 per cent reflection value; lower walls may be darker. The color of walls is determined to some extent by the climate; in cold zones a warm buff is desirable; in torrid zones gray-greens or blues may be preferable. In the near future fluorescent lighting may prove most desirable for schools. Then the colors of walls will have to be considered in this connection. Walls, ceilings, woodwork and all furniture in the room should be in dull finish to prevent glare.

Equipment of Sight-Saving Classrooms

Sight-saving classes are equipped with movable, hygienic, adjustable seats and desks that lift to any desired angle so that material to be seen may be in correct eye focus. The desk tops may be pushed back and forth in order to obtain comfortable, individual distances.

Children in sight-saving classes are encouraged to place seats and desks, work tables, etc., in such position that no child faces the light or sits in his own shadow. It has been found that turning desks approximately 30 degrees away from the windows will prevent glare from the skyline and increase ease of seeing.

Black chalkboards are gradually giving place to those in light gray-green or deep buff; they are made of composition or special glass. On the former, white chalk gives an excellent contrast; on the latter a blue chalk which is now on the market may be used advantageously.

Typewriters in large type are part of the equipment and children are taught to use the touch system in order to reduce eye use to a minimum.

Educational Media

Sight-saving classes are provided with books in large type, globes and maps in distinct colors without detail, special paper, pencils

with heavy lead, large chalk and material for handwork that may be correlated with their academic programs and may also be used at home in order to take the place of close eye work.

The Sight-Saving Class Teacher

The most important consideration in the success of a sight-saving class is a well-trained teacher who understands the difficulties under which partially seeing pupils work, does everything in her power to help them meet these difficulties, but places emphasis on their possibilities rather than on their limitations.

Such teacher should have the basic educational training required for all teachers in the community. In addition, she should have taken intensive courses in anatomy, physiology and hygiene of the eye, common diseases of the eye and refraction, together with observation in eye clinics, and special education courses that will fit her to adapt school procedures to the needs of the child, as well as observation and practice in sight-saving classes. One of the essential qualifications of such teachers is good sight, since a very great amount of eye work will be required.

Educating the Partially Seeing Child in Rural Communities

For partially seeing children in rural schools or in communities too small to warrant the establishment of sight-saving classes, the problem of education is difficult but not impossible of solution. In some instances a class is established in a consolidated school. In others, pupils are sent to the nearest sight-saving class.

In cases in which no other arrangement can be made the rural school teacher may be provided with the necessary educational material. This provision should be made by the state or county board of education. It might be pertinent to draw again on the *Reader's Digest*. Aunt Becky was listening very carefully to a sermon during which the negro preacher mentioned all sorts of crimes from murder to shooting craps. Her agreement was shown by her loud "amen's" and "praise de Lawd!" However, when the preacher touched upon snuff-dipping the subject was a little too near home for Aunt Becky, and turning to her neighbor she said audibly, "Dar now! He's done stopped preachin' and gone to meddlin'!"

With the many new organizations formed it is a little difficult for the members of each to know exactly what the functions of the job are. Sometimes these are so overstepped that they certainly come under the head of meddling. To illustrate:

In a city in which there were a number of children with seriously defective vision needing the advantages of a sight-saving class, the superintendent of schools was not very modern in his thinking. With great difficulty those who were interested finally persuaded him to put in an experimental class.

A social service worker, who had not kept in touch with developments, decided to take the matter into her own hands; she went to a service club and asked if the members would be interested in having sight-saving classes established. They indicated considerable interest. She then went to other organizations and finally took the results of her labors to the superintendent of schools. He stated that he had been about to open a sight-saving class as an experiment, that preliminary arrangements had been made, but that since the service and other clubs were desirous of having sight-saving classes, he was perfectly willing that they should take the full responsibility, but that, of course, the class would not be established in the public schools. He indicated that if such class were the responsibility of the board of education, the social worker would naturally have talked with him before taking up the matter with the various organizations. It was not until a new superintendent was appointed that the establishment of a sight-saving class could be again taken up; all the preliminaries had to be gone over a second time.

It definitely is within the province of the department of public welfare to find these children and to recommend them for educational opportunities, and here the social worker has a very big responsibility. But it is essentially the rôle of the board of education to see that these opportunities are offered even though such board, having no resources of its own, may call on other organizations, public and private, for assistance.

The most successful undertaking for rural, partially seeing children for whom sight-saving classes cannot be provided, is in those states in which there is a special supervisor in the state department of education who sees that books are provided by the state library and who visits the schools and gives necessary help to the teacher in the use of material. It is the experience of those who have tried

out various plans that little, if anything, is accomplished by just providing books in large type, since this is likely to give a false sense of security. If there is no department of special education and no special supervisor, state or county supervisors of elementary education would do well to prepare themselves to give the necessary instruction and other help to rural teachers having such children in their communities. This would have a far-reaching effect in which the social worker would share, for the attention necessary for educational procedures in the case of the partially seeing child widens the horizon of the teacher and makes her conscious of the necessity for conserving the sight of all children; and in this undertaking she looks to the social worker as her ally.

Social workers coming in contact with partially seeing or with blind children have a definite responsibility toward possible restoration of sight through surgical or medical means. Many states are now including operations for cataract, ptosis and strabismus under the Crippled Children's Act. The social worker must often be the one to act as a liaison person to bring together the child presenting a need and those who can meet it.

Emily had a chalazion on her eyelid—a kind of blind stye formed by the blocking of the oil glands in the lid. It was not serious and hardly noticeable. However, it troubled her mother; the neighbors, having little but advice to give, showered this upon her. Said one, "A man down the street will take that off in a jiffy." So down the street went Emily with her mother. He did take it off in a jiffy but unfortunately he took most of the eyelid with it, and Emily was left not only without protection against light, but she became the object of such curiosity that she soon refused to go to school and developed an anti-social attitude.

A social worker visited the home one day before Emily had time to hide. She set herself to win the confidence of the child and, knowing resources, finally succeeded in getting Emily to an eye surgeon noted for plastic restorations. Not only was a new eyelid grafted into place, but even eyelashes were made possible. With a new eyelid and confidence restored, Emily has again taken her place in a social world. She is not quite sure whether she wants to be a plastic surgeon or a social worker. It is hard for her to decide because she realizes that both are necessary to the welfare of humanity.

Planning an Individual Reading Program For a Child in a Sight-Saving Class

Margaret Balch

MRS. BALCH emphasizes the need to adapt the reading program to the individual needs of the sight-saving class pupil.

Introduction

This is a preliminary study, the purpose of which is to develop a practical reading program to meet the general and the specific needs of children in a given sight-saving class. This class, operating under the co-operative plan, is made up of sixteen children in grades ranging from first through eighth. The study was planned to help the writer, first, in diagnosing the individual reading problems of the children in the class; second, in analyzing the ophthalmologist's report concerning each child, and in interpreting each report in terms of educational possibilities and limitations for that child; and third, in setting up a practical reading program for each child in the light of these analyses.

Such a study must, of necessity, rest upon the understanding of certain distinctions between the reading situation in the typical classroom and that in the sight-saving classroom. In the life of the typical child reading is not only the key subject for practically every other school subject, with the exception of such special subjects as art, physical education, and in some cases, music, but also the means by which the individual is expected to get a large proportion of his information as he goes through life. Furthermore, the school endeavors to give the child a lasting desire to read for pleasure and for recreation, thereby providing for him a leisure time activity which throughout his life will be an important means of enriching his cultural and informational background. Reading,

therefore, to the child with good vision becomes a means of acquiring information, understandings, and appreciations.

Reading in the life of the child with poor vision must serve a much narrower purpose. The child in a sight-saving class must be taught to read, but the amount of reading that he does must be limited. The length of time he devotes to reading is shortened in order to save his sight. Thus it seems reasonable to assume that scientific experiments which determine ways to economize time in reading or in learning to read should be of particular benefit in planning the reading program for him. Ideally, the time he uses his eyes in learning to read and in reading should give the maximum results.

Emphasis should be placed on good instructional procedures in any class. Of even greater importance are they to the sight-saving class. While good instructional teaching will minimize the amount of corrective work necessary, nevertheless there are certain factors entering into the situation in a sight-saving class which give rise to a definite need for a good remedial program. In the first place, all too frequently visual difficulties are not recognized until children have been in school for some time and have become reading failures. In the second place, social and emotional maladjustments are likely to be more common among children in a sight-saving group than among those in a typical group, and such maladjustments often lead to reading difficulties. In the third place, psychological factors may be the underlying reason for a child's experiencing difficulty in learning to read in spite of good instruction. For instance, some children do not have the phonetic sense that others do. Mirror writing and mirror reading, and reversal tendencies are strong in some children. Speech defects and slovenly speech habits, sometimes found among children of low vision, contribute to poor reading.

It is evident that a good reading program for any atypical group of children must embody the essential features of a good instructional program for typical children. Therefore the first part of this study is concerned with determining a good general plan for the teaching of reading at various levels, which is based upon recently developed techniques and practices, and upon studies, investigations, and experimental data which meet with the sanction of

recognized reading authorities of the day. In the second division of the study, an attempt has been made to modify this program for children with visual handicaps. A brief review of current educational writings concerned first with eye hygiene and reading, and second, with determining relationships between defective vision and reading abilities, comprises the third part of this study. The fourth problem taken up is the planning of special reading programs for a few children in the particular sight-saving class referred to at the beginning of this paper. These children, because of their eye conditions, require highly individualized reading programs.

Case studies are presented to illustrate how the ophthalmologist's report and the teacher's diagnosis of reading difficulties were used in formulating these individual reading plans.

The study will be concerned with reading in the elementary grades.

A Good Reading Program for Typical Children

So much has been written concerning good instructional reading programs, and the field is so broad, that we will attempt here only to outline the basis upon which one must build such a program.

The specific aims of reading for the stages of learning to read must be understood. Dr. Gray classifies these stages as "the period of rapid growth in fundamental attitudes, habits, and skills," and the "period of wide reading."* The first period mentioned here coincides with the primary grades and the second period with the intermediate grades.

Dr. Gray explains that "in the lower grades instruction ordinarily is focused on the development of such fundamental habits as: first, speed and accuracy in recognizing common words; second, ability to make an independent attack on new words; third, discontinuance of 'crutches,' such as pointing, the use of line markers, and vocalization; fourth, the establishment of correct eye-movement habits; and fifth, reasonable skill in using reading as a thought-getting process."*

The leading objectives for the upper grades are "growth in power

* Gray, William S., "The Nature and Types of Reading," *Thirty-sixth Yearbook; Part One, the teaching of reading, a second report*. National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1937.

to comprehend, appreciate, and evaluate materials, and to use reading in pursuing other activities."*

In summarizing the opinions of the recognized reading experts, we may say that the reading program of the first three school years should build up proper attitudes towards reading; should provide a good sequential plan of instruction based on the interests and abilities of the children at various levels; should be guided by the maturation levels of the children; and should give children means of attacking new words, through phonetic clues, through recognition of parts of words, and through contextual clues. During this period correct directional movement should be established, comprehension of what is read should be cultivated, the ability to recall what is read should be developed. The entire program should be varied so that skill is acquired in reading different types of material and in reading for different purposes.

In the intermediate grades reading covers a wider range, and reading for specific purposes is stressed. More silent reading is done. There is emphasis on the "research" type of reading, requiring the use of the index and the dictionary. Children must learn ways to locate material quickly and to "skim" the page. Ability to read in several fields, such as the social studies, arithmetic, and the natural sciences, becomes necessary. Children should be taught to pick out what is important, to organize information, and to make intelligent application of what they read. Through reading at this stage the child broadens his knowledge, increases his understanding, and cultivates his appreciation.

A Good Reading Program for Children in a Sight-Saving Class

A good reading program for a sight-saving class will rest, first, upon the teacher's knowledge of good teaching practices to be used with normally sighted children; second, upon the teacher's versatility and facility in adapting materials and methods to the individual needs, particularly physiological needs, of the children in the class; third, upon the constant building up of background and concepts through purposeful activities other than the child's read-

* National Society for the Study of Education. "Report of the National Committee on Education." *Twenty-Fourth Yearbook*, Part One. Bloomington, Illinois: Public School Publishing Company, 1925.

ing in order to give richer meaning to what he does read; and fourth, upon a careful selection of reading materials, so that what the child reads not only meets the requirements of good eye hygiene, but is also of real interest and of educational value to him.

A point that must not be forgotten is that more than usual care must be taken to give a child with a serious visual handicap the best possible teaching of reading during his initial reading experiences. For the sake of economy of eye use, the best reading habits possible for him with his visual apparatus should be established during his first few years of reading.

As sight-saving class pupils use books printed in clear type, twenty-four-point print, some reading material is available at each reading level. It is assumed that sight-saving classrooms are correctly lighted and that the children in the class read in the sight-saving classroom. However, two definite restrictions must be made. In the first place, the length of time each child may read is limited because of his eye condition. In the second place, the amount of material available for him to read on any given subject is only a fractional part of that which is at the disposal of the child in the regular classroom. This is due in part to the expense of printing books in the clear type, twenty-four-point print, which limits the publisher to printing only that material which will be used throughout the entire country in sight-saving classes.

The child who is greatly restricted in the length of time he may read loses the beneficial effects on reading skills that are the direct results of reading a large amount of material. In stressing the value of extensive reading of material "unencumbered by word difficulties," Gates says, "If you would provide six, eight, ten, twelve times as much reading material as you now have for each unit assignment of new words, you will have taken a most important step in teaching pupils to read."*

By narrowing the variety of material he reads on a particular subject, we may deprive him of the richness and depth of understanding that come from reading material stated and presented in diversified ways. The sight-saving class teacher should see that

* Gates, Arthur I., "Needed Research in Elementary School Reading," *Fourth Annual Research Bulletin*, National Conference on Research in Elementary School English, February, 1936.

these limitations are compensated for as adequately as possible. There are several ways of doing this.

The two most universally and most frequently used means of meeting the problem of meager reading material for particular lesson assignments are having the necessary material read aloud to the children, or having it typed on the special typewriter used in the sight-saving class. With this help the child can have his work coincide with that of the child in the regular class, and he is prepared to take part in the daily recitations and discussions in the regular classroom.

Care must be taken to have only as much typed material as is absolutely necessary to enable the child to follow the daily work being done in the regular class. The sight-saving class teacher must use good judgment in regulating the amount of typed material read by the children. Only typed material of real educational value should be used.

Frequently good clear-cut pictorial material can quickly and with a minimum of eye use give the child more exact information than he might gain by reading several pages. Pictures, graphs, and posters, well chosen, may be used to advantage.

While well-planned trips and excursions are of unquestioned educational value for all children, they are of special significance for partially seeing children. They provide means of broadening interests and of gaining accurate information. They give opportunities to learn through seeing, hearing, feeling, and even smelling, sense experiences too seldom incorporated into our educational programs. They also serve to substitute learning through direct experience for the vicarious experiences of reading. They are ideal media for giving the child with poor vision new information, clearer understanding of social relationships or of natural phenomena. Through these direct experiences the child builds up a vocabulary which has real meaning to him. These experiences that build background for intelligent reading are possible without close eye work.

Many of the same advantages may be gained in meeting, talking with, or in being given informal talks by people whose hobbies, experiences, or work is such that they have worth-while information or inspirational material for the children.

It is believed that a child reads more rapidly and with greater ease material concerning things he knows about if it is written in language understood by him. Therefore it seems logical to believe that a more thorough introduction than is necessary for typical children to reading in a new field would be advisable for children with eye difficulties.

A good program of oral language work is a splendid means of developing abilities that contribute to reading efficiency. The effectiveness of oral language work and also of building up a background was demonstrated by Miss Peck in a study of the reading ability of visually handicapped children. She showed that improvement in reading resulted after special attention was given to oral language and to increased reading to children at school, at home, and during library story hours.*

The radio, the talking book, and the dictaphone, all of which are valuable in sight-saving classes, are used to provide the children with defective vision with much that other children get through reading. These machines are all excellent substitutes for reading, and also serve as a means of improving reading.

We have mentioned here only a few of the devices for building backgrounds and vocabularies and for keeping the reading program filled with life and interest. We believe that any means of making reading interesting and understandable to the child makes it easier for him to read and therefore taxes his eyes less than material that is neither interesting nor understandable to him.

Adapting the Reading Program to Individual Needs

The reading of some children in a sight-saving class can be adequately provided for through their class reading experiences. By this phrase is meant those experiences which are planned for the members of one grade level in the sight-saving class. Such a group usually consists of from two to five children. Their program will follow the lines of a good reading plan for partially sighted children. Such a plan should include group reading, individual reading, silent reading, audience reading, reading of many different types of material, and reading for various purposes. No matter

* Peck, Olive S., "Reading Ability of Sight-Saving Class Pupils in Cleveland, Ohio," *SIGHT-SAVING REVIEW*, Vol. III, Number 2, June, 1933.

how flexible the general reading plan is, there will be some children whose eye conditions are such that highly individualized plans are necessary for them.

Case studies of a few of the children in one sight-saving class who required specialized reading programs are given here. They were made for the purpose of giving the writer as full and as clear a picture as possible of all the circumstances that might directly or indirectly influence the reading of these children. In each case the eye condition is the factor to be given prime consideration. The available data have been assembled and an attempt has been made to consider not only the physical and mental characteristics of each child, but his emotional, social, and personal problems as well, in planning for him a reading program that will avoid too great a tax on his eyes, but one that will promise constant and satisfying progress for him.

The grades given are as of June, 1940. A child listed in the third grade was completing his third grade at that time, because there are no mid-year promotions in this school system.

As large-type standard reading tests were not available, standard reading tests for the regular classes were adapted and given in all grade levels in June, 1940. The results, of course, could not be considered valid. However, they did give the teacher definite indications of certain abilities and disabilities. For this reason the teacher's estimate has been used in rating the child's reading ability.

Betts' Ready to Read Tests were given to some of the children in 1939. The results are given for those children who took the test.

Taken as a whole, many of the data are incomplete. Certain information available for some of the children is not at the present time available for others. Yet in each case there is enough known to make a satisfactory diagnosis of the reading situation. The important phase of these case studies is the use made of the ophthalmologist's reports in determining definite teaching procedures.

Case Study: J. B.

Boy. Age 9. Grade 3. I. Q. 120.

Oculist's Report.—Vision without glasses: right eye, 8/200; left eye, 8/200. Vision with glasses: right eye, 20/200; left eye, 20/200.

Prescription: O.D. $-8.00 -2.00 \times 135$.

O.S. $-8.00 -4.00 \times 130$.

Medical diagnosis: Myopia complicated by nystagmus and amblyopia. Cause unknown, though probably hereditary, anatomical, or dietary.

Prognosis: May be capable of improvement.

Oculist's Comments: This child is very nearsighted. The difficulty is progressive and the etiology is unknown. He should use his eyes enough to meet your educational problems under the sight-saving program, but not for extra reading problems. Diet of vitamins A, B, and D and hygienic home environment, if possible, are indicated.

Betts' Visual Sensation and Perception Tests.—Distance fusion—failed; visual efficiency—two eyes—60 per cent; left eye—0 per cent; right eye—60 per cent; vertical imbalance—failed; coordination level—failed; lateral imbalance—failed; reading distance fusion—failed.

Home Conditions.—Good comfortable home in outlying district with plenty of room to play and roam through the woods. Finances difficult. Father has been ill and unemployed. Mother works. Parents' attitude toward child and his visual difficulty very good.

Teacher's Estimate of Reading Ability.—Good average reading for grade level; speed, slow; word recognition, fair. Word attack is not good through phonetic approach. Boy appears nervous and annoyed when an unrecognized word delays his progress and in the resulting confusion he wastes time before really attacking the word. This is especially true if he is reading aloud before other children.

Comprehension of what is read, very good; recall, very good; application and using information gained through reading, excellent.

Related Difficulty: In writing J. B. frequently reverses letters, especially in short words.

Child's Attitude Towards Reading: J. B. did not like to read and frequently suggested other things to do. In the last year he has begun to enjoy reading.

Abilities of child that should be utilized: Excellent understanding of arithmetic; excellent understanding of social studies; ability in art work (especially poster-making); interest in what is going on in the world; broad vocabulary.

Pertinent History: This boy is quite conscious of the fact that he is a year older than most of the children in his class. When he was six years old he entered a regular first grade class in another city where there was no sight-saving class. He used the same materials as the other first grade children, and though he liked to play with very small toys, he did not learn to read from the small print books. He developed temper tantrums, mischievous tendencies, and a sensitiveness about his inability to read. He used many devices to cover up the fact that he could not read. Having a sister a few years older who is very bright and who learned to read easily added to his self-consciousness.

He entered the sight-saving class the following fall and began first grade again. He found himself in a sight-saving class with two other children who were quite inferior to him mentally. As his reading advanced much more rapidly than did theirs, he overcame his habits of avoiding reading and of pretending to be reading stories that he could not read. His mastery of mechanics of reading progressed normally, though his reading vocabulary did not build up as quickly as might be expected from his intelligence and his age.

In the second grade a little girl who was about a year and a half younger, but an excellent reader, entered the class. J. B. reverted to some of his previous devices for appearing to be more capable than he was. While the situation was recognized by the teacher and various means of coping with it were attempted, the problem remained in the boy's mind. It is possible that his confusion when presented with unrecognized words is related to this.

When he entered the third grade, a second little girl of outstanding ability entered the sight-saving class. The problem for J. B. was further augmented. Fortunately he surpassed both girls in arithmetic, which compensated in a measure. Though competition and comparison of abilities were avoided by the teacher, the boy is intelligent enough to face reality and make his own comparisons, and what he finds annoys him.

Teacher's Diagnosis: J. B.'s reading difficulties are probably largely due to physical and emotional factors. This boy, who is intellectually capable of a high standard of accomplishment, is hampered by physical limitations. The slowness of reading and the

reversals are probably due to his nystagmic condition. Because his eyes tire quickly, his reading periods must be short. However, being eager to go ahead more rapidly and excel, he is constantly building up unfortunate emotional reactions to his own reading, which is slow and unsatisfactory for him.

Suggested Reading Program for J. B.: The two conditions that must be adjusted to are, first, low vision complicated by nystagmus, and, second, the child's own emotional reactions. It is likely that the eye condition will not ever improve. The boy will probably always have very poor vision and also the constant movement of the eyes known as nystagmus. These conditions will influence what he will be able to do all his life; and must be kept in mind in planning any program for him. As these conditions may be considered unalterable, the program must be adapted to them as a permanent factor. On the other hand, the changing of the emotional reactions is desirable and must be an end in view in planning the program.

Prognosis.—J. B.

If this boy's myopia does not progress further and if family finances permit, he should be able to go through high school and do some college work. Knowledge of family conditions, however, indicate that he will attend school through high school. He should be able to enter an occupation that requires intelligence and a high school education, but a minimum of eye work.

Program.—The program recommended consists of the following:

1. The length of time J. B. is allowed to read should be quite restricted—possibly to 45 minutes a day.
2. Reading activities should be scattered throughout the day.
3. Reading activities should be varied (some book work, black-board work, etc.).
4. Oral reading that gives him prestige would be good. (Reading to younger children stories or information that is of interest to them but too difficult for them to read.)
5. More than the usual amount of reading should be done for this boy. It should be done by the teacher, a reader, the parents, and older sister.
6. J. B. should be encouraged to use as many ways as possible to gain information without using his eyes for close work (radio,

trips, meeting and talking with interesting people, the talking book, and the dictaphone).

7. He should be helped to develop along the lines in which he shows ability, namely: arithmetic, art, and social understandings. Possibly the art and social study fields would be the wiser choices. Creative work along these lines should be provided for. Making sand table projects, large paintings or friezes, and posters, especially those of value in integrating his social understandings, would not only be developing his abilities, but would be providing excellent emotional outlets as well.

8. J. B. should be given frequent opportunities to share the results of his work with the children with whom he works in his regular class. Oral reports, art work, or project material can be used.

9. Emotional training is needed. If this boy could learn to accept his eye condition, he would probably gain emotional stability, and begin to feel greater satisfaction in all his school work. Satisfaction in his reading might improve the quality of his reading.

10. Close contact with the home should enable the teacher and the parents to work together for wholesome personality and emotional growth in the child.

11. A thorough explanation of the program should be made to the teacher of the regular class in which J. B. works, and to his parents.

This may sound like too broad an educational plan to be popularly called a reading program. It is, however, a program that should give this boy many of the educational advantages that other children gain directly from reading. In that sense we choose to call it a reading program.

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Eye Protection Experience in Mining Operations*

R. H. Seip

FIFTEEN years of a program of eye conservation in this mining industry indicates healthy progress with a marked increase in the number of employees co-operating by wearing goggles continuously.

THE program of eye protection and the policy governing it which are presented in this paper make no claim for 100 per cent protection or for the complete elimination of eye injuries. They are presented, rather, as a guide to a sensible and workable program that should obtain the co-operation and support of the employees.

The protection of the eyes of employees has been a part of the accident prevention program of the New Jersey Zinc Company since 1912. The use of safety goggles always has been advocated and goggles always have been supplied without cost to the employee. Prior to 1930, at which time a full-time Safety Division was created, no specific standards for goggles had been established, and no definite requirements for their use had been made.

In the period from 1926 to 1930 goggles of various styles and makes were tried in order to determine those best suited to our conditions and to our employees. Improvements were made rapidly by manufacturers in this period, not only in styles of frames for various purposes, but in the character and quality of the glass lenses. From the viewpoint of the employee, comfort was most important. The frames of the closed type of goggles were made to be form-fitting, while the old nose bridge of the spectacle type

* Presented at the Twelfth Annual Safety Convention of the Greater New York Safety Council, April 23, 1941.

was replaced by adjustable nose pads such as are used on high grade corrective glasses. The change from a round lens to the "tear-drop" shape with the raising of the temples to the "ful-vue" position overcame many other objections by the employees. A distinct advance was made also in the standardization of lenses for protection against harmful light and heat rays.

The result of these experiments was the adoption of goggles of all types produced by one manufacturer. This decision was based not only on the products themselves, but also on the fact that such adoption would reduce to a minimum the number of styles and types of goggles to be carried in stock, as well as the quantity of repair parts that would be required. Another result of this standardization was a definite change in the attitude of employees toward the more general use of goggles. At this time no specific requirements had been set up, but greater emphasis was placed on recommendations to the employees that goggles be worn where hazards existed.

Coincident with this step was the campaign for the reporting and treatment of all injuries, regardless of their nature. Consequently there was an increase in the number of "eye cases" reported in 1930. In order that the progress of experience may be observed, the table on page 123 is interpolated.

The necessity of a more definite program for the conservation of vision was indicated in 1931 when the statistics of the first cycle of periodic physical examinations of all employees disclosed the fact that the physical defect involving the greatest number of employees was that of vision. In the examinations vision was not recorded as defective unless the visual acuity was less than 20/40 in one or both eyes. The statistics showed that 17.1 per cent of the total number of employees examined (1,265) had some considerable degree of defective vision, either corrected or uncorrected.

Inasmuch as one of the primary purposes of the physical survey was to extend helpful advice to employees, particularly in cases where improvement could be made, the matter of defective vision was given first consideration.

Consequently, arrangements were made to have the visual acuity of the 17.1 per cent with defective vision checked by a competent medical specialist. This check-survey was conducted at the Frank-

lin Plant without cost to the employees. Subsequent to this check-survey each employee was notified of the findings in his case, and, of the 200 employees examined, 118 were advised to have a complete ophthalmological examination. No recommendation was made as to whom they should consult beyond urging them to have the examination made by a competent medical specialist.

SUMMARY OF EYE INJURIES CAUSING LOSS OF TIME,
FRANKLIN AND STERLING PLANTS

	<i>Franklin</i>	<i>Sterling</i>	<i>Total</i>	<i>Shifts Lost</i>	<i>No. of Perm. Dis. Cases</i>
1926.....	11	3	14	252	2
1927.....	17	1	18	112	..
1928.....	10	0	10	207	4
1929.....	13	1	14	436	6
1930.....	33	16	49	658	9
	<u>84</u>	<u>21</u>	<u>105</u>	<u>1,665</u>	<u>21</u>

The average number of employees for this period was 1,450.

1931.....	15	14	29	172	3
1932.....	2	3	5	15	0
1933.....	7	1	8	30	1
1934.....	0	2	2	3	0
1935.....	1	3	4	35	1
	<u>25</u>	<u>23</u>	<u>48</u>	<u>255</u>	<u>5</u>

The average number of employees for this period was 1,120.

1936.....	7	2	9	34	1
1937.....	3	1	4	17	1
1938.....	3	4	7	44	0
1939.....	4	0	4	10	1
1940.....	1	1	2	52	1
	<u>18</u>	<u>8</u>	<u>26</u>	<u>157</u>	<u>4</u>

The average number of employees for this period was 1,175.

Grand Total..	<u>127</u>	<u>52</u>	<u>179</u>	<u>2,077</u>	<u>30</u>
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To comply with this recommendation it would have been necessary for employees to travel to some city with possible loss of time and wages. Such necessity was eliminated when arrangements were made with a competent medical specialist to make examinations at Franklin and to furnish prescriptions at a low cost of \$5.00

to each employee examined. A similar arrangement was made with a reliable dispensing optician who made the necessary optical measurements and offered a selection of frames. The price of the finished glasses was dependent upon the style and quality of the frames selected, and the finished glasses were supplied to employees at slightly more than cost. The optician made a second trip to the plant to properly fit the glasses.

Of the 118 employees who were advised to have complete examinations made, 87 did so and obtained glasses. Among the remaining 31 were many who already had glasses, but of which fact the Company had no prior record. As a result of the program, the majority of the defective vision cases and the most serious of them were corrected.

The survey statistics also showed 63 employees with a visual acuity of 20/200 or less in one or both eyes. As this fraction is considered as industrial blindness, it was felt essential that adequate protection should be provided against injury which might affect the remaining vision. Accordingly, this group was required to wear safety goggles continuously while on duty. In cases where prescription goggles would correct the poor vision, safety goggles made to prescription were and are supplied to the employee without cost to him. The sole requirement is that the employee present a prescription from his doctor. Thirty-one of the 63 employees with visual acuity of 20/200 or less were supplied with prescription goggles, 25 with plain goggles, and seven were not required to wear safety goggles due to the nature of their work. Each member of this group was given a letter from the superintendent at the time his goggles were delivered to him, with definite instructions to wear the goggles continuously when on duty. A copy of this letter was placed in the employee's file in the Personnel Office.

The statistics of the second cycle of periodic physical examinations in 1935 disclosed a higher percentage of employees with defective vision—21.1 per cent as compared to 17.1 per cent in 1931. This figure included practically all of those examined in 1931 and there was almost no turnover of labor in the four-year period. Further analysis showed that, of the 239 employees with defective vision, 116 were corrected and 29 were tested for visual acuity by a specialist without recommendations for correction.

By this time the policy of the management relative to its eye conservation program was well established and it was felt to be unnecessary to bring an oculist and optician to the plant. Employees may consult them, however, and receive the same consideration in costs as in 1931. The employees have been most co-operative, and, during the eleven-year period from 1930 to 1940 inclusive, 241 have presented prescriptions and have been supplied with prescription spectacles.

Prescriptions normally received from oculists or optometrists rarely supply all of the necessary information and many carry only the lens prescription. Hence, it has been found helpful to provide the employee with a form on which the prescription and all necessary measurements may be entered. These measurements are most important to obtain the correct fit of the goggles.

The results of this program have been so satisfactory to both the management and to the employees that it has been and probably will be continued. Recommendations are made to employees to consult a medical eye specialist for examination. Many of them consult optometrists, however, and prescriptions from optometrists are accepted.

Coincident with the start of the medical part of the program in 1931, concentrated effort was directed to the accident prevention part of the program, with special emphasis on the elimination of eye injuries. The general results may be noted from a study of the table at the beginning of this report. It will be seen that, in the five-year period from 1926 to 1930 inclusive, there was a total of 105 cases of eye injury causing loss of time, and in 21 of these cases some degree of permanent disability resulted. In the next five-year period, from 1931 to 1935 inclusive, the total number of cases decreased to 48 with only five resulting in any permanent disability. A further reduction is shown in the next five-year period, from 1936 to 1940 inclusive. The total number of time-loss cases dropped to 26 and only four of these suffered any permanent disability. In the entire 15 years the total number of employees never has been less than 1,100.

In the eleven-year period from 1930 to 1940 inclusive there have been four cases resulting in the total loss of one eye. In two of these cases the use of goggles had been recommended for the type

of work being done, but were not worn at the time of the accident. In one case the use of goggles was not required and in the fourth case, in an accident in which the employee drilled into some explosive in a drill hole, the force of the resulting explosion was so great as to blow the lenses entirely out of the frames.

As has been stated, for many years safety goggles were supplied to employees with recommendations that they be worn when working under conditions that might be hazardous to the eyes. Compliance with these recommendations was left to the judgment of the employee, with the result that goggles were not worn to any great extent. In 1932 more rigid rules were placed in effect and were incorporated in printed booklets of Safety Standards which were given to all mine employees. These requirements were extended in a re-issue of the Safety Standards in 1936. In 1938 similar Safety Standards were printed for all departments except Mining. Specifications for the types of goggles to be worn on certain jobs were included.

For general underground work, each employee was supplied with goggles of the closed type with clear lenses. In cases where the continuous use of goggles was required the spectacle type was supplied. Mine employees are not required to wear the closed type continuously because of fogging due to temperature changes, perspiration, etc., and any restriction of vision, such as this would cause, is undesirable where illumination is limited. The closed type with elastic headband can be worn on the miner's hat and may be drawn down over the eyes. It was felt that more use would be made of the goggles if they were readily available than if spectacle goggles were supplied and carried or kept in clothing pockets. It has long been the opinion of the writer that the spectacle type is more desirable from the standpoint of comfort and ventilation and provides adequate protection from flying particles. The closed type of goggle is being gradually replaced by the spectacle type. Many employees wear them continuously. Others carry them, when not in use, in a canvas pouch attached to the belt.

The general types of goggles now in use are as follows:

Closed type with ventilated side screens, clear 50 mm. glass lenses, and elastic headbands. These are gradually being replaced by the

Spectacle type with clear glass lenses set in "ful-vue" frames with nose pads. The 50 mm. type are gradually being replaced by goggles with 47 mm. lenses.

Spectacle type with tinted glass safety lenses for glare from furnaces or sunlight.

Spectacle type with safety lenses ground to prescription. 50 mm. lenses are not used to avoid exaggerated decentering of lenses.

Closed type with special colored lenses for protection from welding and cutting rays. (Goggles are not worn by electric welders. Welding helmets are worn for this type of work.)

Driver's type with tinted wide lenses for glare—not safety glass.

The trend away from the closed type to the spectacle type is definite, but has resulted in a more general continuous use of goggles throughout the mine and plant.

It has been the policy to supply goggles to employees without cost. They are expected to receive reasonable care, but are replaced when lost or damaged without argument. The cost of the goggles is borne by the department in which the employee works as a check against abuse of the policy.

In the eleven-year period from 1930 to 1940, goggles of various types have been supplied as follows:

Closed Type (Protective).....	2,499
Closed Type (Welding).....	104
Spectacle Type.....	1,839
Prescription.....	241
Sun Glasses.....	19
Total.....	4,702

The approximate cost of these goggles was \$7,800. The loss of a single eye results in a cost of about \$2,000. Thus, if only four eyes were saved during this period, the goggles have more than paid for themselves. There is ample evidence from many shattered lenses to prove that many more than four eyes have been saved from injury or total loss. In one specific case a mine employee was engaged in excavating a drainage ditch along the side of an underground drift which had been driven about 12 or 15 years before. He was wearing closed type goggles. He struck a projecting piece of rock with a sledge. An explosion followed as the result of the

detonation of some explosive which had been in an old lifter hole since the time the drift was driven. He suffered a compound fracture of the jaw, with numerous severe lacerations of the head, face, arms, and body. His eyes were uninjured although one lens of his goggles was blown out completely and the other badly shattered. Without goggles this employee, in all probability, would have been permanently and totally disabled. He is working at his normal occupation.

It has been our experience that the most of our disabling eye injuries have occurred when goggles were not worn where recommended or required, or on work where the use of goggles has not been required. In view of this fact an extension of the requirements for the use of goggles was contemplated several months ago. Such an extension could have been made simply, but without the co-operation of the employees it would not accomplish the desired result.

Consequently the employees were asked by the management to select certain of their members to meet informally with the Safety Division Chief for a discussion of the goggles program. No minutes were kept of these meetings and no employee's statement was quoted. The discussions were free and productive of many good suggestions. Some of the opinions expressed follow:

1. The men feel that there is a need for wearing goggles of some type for their own protection.
2. There is no objection to the use of goggles on jobs on which the use of them is required by the Company, where conditions, such as fogging, do not make their use hazardous.
3. Goggles are not worn to the extent they should be worn because it is somewhat of a nuisance to put them on for a moment or two for certain jobs.
4. Goggles are worn in proportion to the extent their use is enforced by their bosses.
5. Improvements should be made in fitting goggles to the individual—particularly the spectacle type.
6. A few opinions were expressed that the continuous use of goggles might cause eyestrain. They were assured that, due to the quality of the optical glass and the precision grinding of the lenses, no bad effects are probable.

7. The prescription goggles supplied by the Company are very satisfactory. It is probable that requests from men with defective vision will increase, due to the fact that, if they are going to use goggles more extensively, they may as well get properly fitted and wear them continuously.

As a result of these suggestions from the employees the Company policy on goggles will include the following items:

1. Continue the present educational program, stressing the advisability of wearing goggles.
2. Gradually extend the requirements for the use of goggles by increasing the jobs and places where goggles shall be worn. In this connection the particular hazards of the job should be indicated.
3. Improve the fit of goggles. This recommendation is now in operation. For several years each new employee, at the time of his employment, is impressed with the value of good vision. A demonstration of the strength of the lenses is made by driving a nail into a pine board with a pair of spectacle goggles as a hammer. This is effective. An attractive case containing several pairs of goggles with different bridge widths is used to obtain the correct size of bridge. A mirror in the case illustrates the various features which have been pointed out. This ceremony is impressive to the new employee.
4. Continue the policy of supplying employees with prescription goggles.

It is felt that the criticisms and suggestions which came out of the meetings with the employees will result beneficially. It is now apparent that there is a marked increase in the number of employees who are wearing goggles continuously. The experience of 15 years, as indicated by the figures in the table at the beginning of this report, indicates healthy progress in the program of eye conservation. The program may not be perfect, but is felt to be workable and sensible.

Saving of Eyes in Industry—A Management Problem*

F. H. Humphreys

MR. HUMPHREYS points out that while the safety department can and should develop the goggles program, only the management can make it effective.

THE methods employed to save eyes in our defense plants are the same as those used in our other plants. They include supplying the type of eye protection needed, trying to convince the employees of the importance of using the equipment provided, and enforcing the goggle rule. The emphasis is placed on the latter.

For years American Car and Foundry plants tried to get men to wear safety goggles to protect their eyes. At first only men engaged in occupations such as grinding, chipping, rivet cutting, etc., where extreme hazards existed, were urged to wear them. No one except a few safety men thought it necessary to protect their eyes, and few men wore goggles, even when doing hazardous work, unless the safety man happened to be around; consequently, in those days eye injuries were frequent and compensation costs high. In an attempt to reduce the accidents and costs, the company adopted a rule requiring workmen to wear goggles when doing hazardous work. Fourteen hazardous occupations were listed. There was some reduction in the eye injuries, but the rule proved difficult to enforce because most men, regardless of their occupation, felt they were exempt from the provisions of the rule.

Foremen often thought the rule did not apply to them even though they might have been directing very dangerous work, and accidents to eyes continued. It was not until steps were taken to

* Presented at the Twelfth Annual Safety Convention of the Greater New York Safety Council, April 23, 1941.

require all employees to wear safety goggles that any plant showed real progress in eliminating eye injuries.

Today such a rule is enforced in all American Car and Foundry plants and it applies to all employees except office employees while in the office. This rule was adopted several years ago after our experience proved it to be both necessary and practical. It had the approval of and was put into effect by order of the vice-president in charge of operations. Prior to the general application of an all-inclusive rule regarding eye protection, any individual plant was permitted to develop and apply its own all-inclusive rule and some of them did. The degree of enforcement of the rule varied in the different plants, depending largely upon the local management's attitude toward the goggle program and the effectiveness of the safety department's educational program.

The company furnishes equipment for the protection of eyes, except prescription safety goggles for new employees, who are charged the actual cost. Prescription lenses are replaced at the company's expense and all prescription lens goggles remain the property of the employees.

Our experience has shown that having a rule and furnishing the equipment are not enough to eliminate eye injuries. Protective equipment must be worn at all times when men are exposed to eye hazards—this means whenever an employee is at work, for eye hazards exist practically every place in our plants.

Many employees in so-called "non-hazardous" occupations do not like to wear goggles because they feel they are not taking any risk without them, but the number of broken lenses in goggles worn on just this type of work has proved to us the wisdom of goggles on every employee.

A painter who had been warned several times about violating the plant goggle rule was called into the office and told that he would lose his job if he was guilty of another violation. While returning to his work he passed between two buildings where he thought there was no eye hazard; his goggle lens was hit and broken when a hot rivet—missed by the pick-up boy inside one of the buildings—flew through a broken window pane. From that moment on this man was one of the most enthusiastic rooters for safety goggles I have ever known.

I could tell you of many other times when men—timekeepers, foremen, upholsterers, etc.—in non-hazardous occupations have saved their eyes with goggles.

Before the establishment of our comprehensive rule, one of the local managers, who had a reputation for watching costs closely, was reluctant to adopt a rule which required every employee to wear goggles, because he felt the expenditure for equipping everyone with safety goggles was not necessary. The safety department had been trying for some time to convince this manager that it was good business to furnish goggles to each employee, but before converting him, an employee at this plant lost his eye. The manager agreed that goggles would have prevented this injury and, after it was pointed out to him that the compensation cost involved in this one accident just about equaled the cost of supplying everyone in this plant with proper goggles, he immediately initiated an all-inclusive goggle program which has been very successful. This manager has since sent us several photographs of broken lenses which have saved eyes.

I am sorry that we have not kept a record of the number of broken lenses for all plants over a period of years, but I am sure the total would be higher than any of us suspect. As far back as 1930 one plant, which had had a "100 per cent" goggle program for six years, proudly displayed a photograph of forty-one men who had had one or more lenses broken while working, without a serious eye injury. One man, a chipper, had a record of three broken lenses. Three riveters in the gang boasted two broken lenses.

All American Car and Foundry plants operated from May, 1938, to December, 1940—two years and eight months—without the loss of an eye. This record was broken when an employee, who had been left by himself to tear out brick from around a boiler, removed his goggles; some mortar entered his eye and scratched it. Infection developed and caused the loss of sight.

We feel that the prevention of eye injuries through the goggle program has helped to reduce considerably our employer's liability expense, which for the year 1940, for all plants, was less than one dollar per hundred of payroll.

After an active interest in the company's goggle programs for sixteen years, it is my opinion that if you expect men to wear gog-

gles, management must be willing not only to furnish proper eye protection, but also to support the goggle program, for only management can exert the pressure necessary to enforce the goggle rule.

To give you an idea of how one of our defense plants dealt with the problem of protecting eyes, I should like to describe briefly what has been done at the Buffalo, New York, plant.

About one year ago the safety and claims department was informed that the company might be called upon to make artillery shell for one of the foreign governments, as well as for our own government in its defense program. This work, if assigned to the American Car and Foundry Company, was to be done at the Buffalo plant which had been closed ten years. We were instructed that no material was to be purchased nor commitments made until actual orders were received. We were further informed that after the receipt of a contract, preparation of the plant was to begin immediately.

We in the safety department knew that our responsibility required us to establish a safety program the minute the first workman was hired, but we could only prepare by making plans in our minds and on paper.

Manufacturing artillery shell was not entirely new to us, as there were still a number of people with the company who had such experience during the first World War. Among these people was the man who is now the general safety supervisor, who knew the hazards encountered in forging and machining shell. In analyzing the operations required for this work, it was readily seen that the eye hazards would be similar to many that existed in the manufacture of railway cars; therefore the rule which requires all employees (except office employees when in office) to wear goggles or other eye protection was applicable to this new work.

We were very glad that the manager assigned to this plant had for many years been a strong believer in "goggles for all." As soon as the supervisory staff was selected, he called them together and told them that all men employed at Buffalo would be required to wear eye protection at all times while at work and that this rule applied to all supervisors as well as other employees. It was essential that the supervisors and foremen set the example for the men. A few days later the vice-president in charge of operations

called a conference of the entire plant administrative personnel and emphasized what the manager had said about eye protection.

On the morning this plant was opened 250 men were employed. Although no goggles had been purchased in advance, a telephone order to one of the large goggle suppliers at 9 A.M. brought a sufficient number of goggles to equip every one of the 250 men with goggles by 1 P.M. Within a few days the office building was cleaned and general routine began to take shape.

Now prospective employees are told of our 100 per cent goggle rule and only those who agree to abide by the rule are employed. After the new men are hired in the employment office, they are taken to the plant dispensary where they are fitted with spectacle-type goggles by the nurse, who has been trained to make the necessary adjustments. The men are told to return to the dispensary if their goggles are not comfortable, or if their work requires any special type of eye protection. They are also told at this time to report to the dispensary if they receive any injury, no matter how slight.

When the new employees reach their place of work they are again instructed by the foreman that it is a requirement of their employment to wear safety goggles at all times; the dangers of eye hazards of the particular jobs are pointed out to them and if the nature of the work is such that special eye protection is needed, the foremen arrange for the employees to be equipped properly. All foremen are advised by the safety supervisor which type of eye protection should be used on each operation.

No doubt many of you are wondering why nothing has been said about the educational part of our program. All plants except Buffalo preceded the 100 per cent goggle rule with an extensive period of education. At Buffalo there was no time for education before the rule became effective, and to our amazement there has been very little resistance to the wearing of goggles; and there have been very few violations of the rule. This experience at Buffalo gives weight to the statement that enforcement is a part of education.

It would be inaccurate to imply that the men hired at this plant had had no safety education, because many of them worked on W.P.A. and others in C.C.C. camps. It is my impression that the safety education given and the discipline maintained by these or-

ganizations made these men more conscious of the use of protective equipment and consequently our task was much easier.

However, without the full support and co-operation of management the goggle program could not have been effective in such a short time, if at all. The safety department can and should develop the goggle program, but only the management can make it fully effective.

A Digest of Problems of Vision Testing for Screening Purposes—Continued

Eleanor W. Mumford, R.N.

The REVIEW continues in this issue the series of digests on problems of vision testing for screening purposes. The material presented by Miss Mumford is not inclusive, but represents a selection reviewed by one of the Society's committees, of which she is a member, which has been studying problems of screening for eye conditions. The selection does not indicate that the committee either accepts or rejects the methods or conclusions of the studies digested, but rather that each study has some bearing upon the consideration of problems of vision testing for screening purposes.

Changes in the Types of Visual Refractive Errors of Children. Antonio Ciocco. *Public Health Reports*, vol. 53, no. 35, Sept. 2, 1938, pp. 1571-1578.

PURPOSE OF STUDY

To investigate changes in type and degree of refractive errors in school-age children.

GROUP STUDIED

1,481 white school children in Washington, D. C. (same group previously studied).*

TESTS AND TECHNIQUES EMPLOYED*

Snellen before and after cycloplegic, ophthalmoscopic and retinoscopic examinations.

METHODS OF CONDUCTING STUDY

1. Retests after average interval of $2\frac{1}{2}$ years (range, 31 months for 6-7 year olds to 26 months for those of 14 years).

2. Analysis of refractive errors of right eye only.

* See abstract, "Refractive Errors in the Eyes of Children as Determined by Retinoscopic Examination with a Cycloplegic." G. A. Kempf, M.D., S. D. Collins, and B. L. Jarman, M.D. *SIGHT SAVING REVIEW*, Vol. XI, no. 1, March, 1941, pp. 44-45.

3. Degree of error recorded to nearest $\frac{1}{4}$ D. required to correct to emmetropia (hyperopia and myopia each include even $\frac{1}{4}$ D. of error plus or minus).

4. Analysis of changes in type of defects and relation between degree and type of error, visual acuity and age.

FINDINGS

1. Frequency of simple hyperopia reduced almost 20 per cent; of astigmatism (hyperopic and myopic) increased 40 per cent; and of myopia increased 70 per cent.
2. Type of refractive error unchanged in over 75 per cent of the eyes; most frequent changes from simple hyperopia and myopia to astigmatism and from astigmatism to simple refractive errors.
3. Chances of changes in type of refractive error appeared to decrease as children got older.
4. Within the $2\frac{1}{2}$ year interval the incidence of myopia (simple and astigmatic) was highest in children 10-11 at first examination and lowest in those 14 and over. The ages for highest incidence rate of astigmatism (all forms) was 6-7 and 12-13; the lowest incidence of new astigmatism cases was also in those 14 and over.

An Evaluation of Vision-Testing Methods in Schools. Preliminary Report. J. B. Hitz, M.D. *American Journal of Ophthalmology*, vol. 21, no. 9, Sept., 1938, pp. 1024-1027. Reprinted in *SIGHT-SAVING REVIEW*, vol. IX, no. 1, March, 1939, pp. 47-52.

PURPOSE OF STUDY

To develop a satisfactory screening test for use in schools by comparing results from certain common screening tests and from certain ophthalmic tests.

GROUP STUDIED

32 children, 6 to 14 years of age, referred to ophthalmological department of children's hospital; no obvious cases of ocular disease included.

TESTS AND TECHNIQUES EMPLOYED

1. *Betts' tests*, administered as recommended in Betts' textbook
2. Ophthalmic battery
 - a. *Snellen* at 6 meters: "uniform artificial illumination," intensity not measured. Normal 20/30 or better.
 - b. *Muscle balance*: Duane screen prism and Maddox rod at 6 meters and 33 cm. Abnormal, esophoria at distance or near, 4 D.; exophoria distance, 4 D.; near, 6 D. Duane and Maddox findings averaged.
 - c. *Fusion*: Worth Four Dot at 6 meters and 33 cm.
 - d. *Depth perception*: Howard-Dolman at 6 meters; depth perception of 50 mm. or under should equal 100 per cent stereopsis on

Betts and, conversely, 100 per cent on Betts might logically show no depth perception on Howard-Dolman.

- e. *Retinoscopy** (Under cycloplegia): limits of normal -0.25 D.,†
 $+1$ D. and 0.50 D. astigmatic error.

METHODS OF CONDUCTING STUDY

1. Comparisons made between
 Snellen alone
 Betts' tests (in toto)
 Ophthalmic battery (in toto)
 Component parts of ophthalmic battery and their counterparts in Betts.
2. All tests given twice to 32 children without glasses and with—if any. (48 examinations two eyes, total, 96 tests.)
3. Evaluations for visual acuity based on figures agreeing within 20 per cent (industrial percentage scale of visual loss).‡

FINDINGS (Presented without tables; no detailed analysis of data):

1. Snellen alone indicated defects in 24 or 50 per cent; Betts in 43 or 89 per cent; ophthalmic battery in 33 or 69 per cent.
2. Betts and ophthalmic methods agreed: for visual acuity in 74, for muscle balance in 81, for fusion in 49 of 96 tests; for depth perception in 34 of 47 tests; for sharpness of vision tests§ in 25 of 32 subjects with uncorrected vision and in 9 of 16 with correction.
3. Higher deviations from normal were found by Betts' method than by ophthalmic for all tests except that for muscle balance. For sharpness of vision tests§ Betts showed errors in 7 of 16 "when error was fully corrected to the best of the author's ability."
4. Reasons given for discrepancies: Dot test misses higher astigmatic errors; stereoscope allows suppression; muscle balance standards (both Betts and ophthalmic) arbitrary; stereoscope stimulates convergence which also affected fusion findings as did difference in visual angles; Howard-Dolman apparatus presents approximately natural while stereoscope creates artificial depth perception.

The Betts Visual Sensation and Perception Tests, a Method of Detecting School Children Requiring Ocular Attention. L. Oak, Ph.D., and A. E. Sloane, M.D. *Archives of Ophthalmology*, vol. 22, no. 5, Nov., 1939, pp. 832-843.

* Retinoscopy was made by author within six months prior to the study.

† In the text, this figure appears as "minus 25 D.," which was interpreted as an obvious typographical error.

‡ Berens, Conrad, editor, *The Eye and Its Diseases*, Philadelphia: W. B. Saunders Co., 1936, page 173.

§ Ophthalmic test for this based on retinoscopy (see above under Tests and Techniques).

PURPOSE OF STUDY

To study the Betts series of stereoscopic tests.*

GROUP STUDIED

Two groups of 100 children each.

Group A: From rural and semi-rural schools; ages 9-15 years; 65 boys, 35 girls who were handicapped in reading or suspected of having visual difficulty.

Group B: Fourth grade of a town school and all pupils of two rural schools; ages 6-15 years; 51 boys, 49 girls "selected at random."

TESTS AND TECHNIQUES EMPLOYED

1. *Betts DB Series*† given twice.

2. *Ophthalmological examination*: (All techniques are given below exactly as mentioned in the study.) Cycloplegic omitted on the basis of separate investigation. (See 2 below under Methods and 1 under Findings.)

Visual acuity each eye separately and two eyes together; interpupillary distance; convergence near point; external examination; ocular motility; pupillary reactions; tension (digitally); ophthalmoscopic; retinoscopic; subjective refraction (Snellen and astigmatic fog test); phoria (distance and near using cover test).

METHODS OF CONDUCTING STUDY

1. Betts' series given twice and scored first according to the manual of instruction and second according to a "system" developed by a representative of the manufacturer (who did this scoring himself).

Group A: two series given by research assistant about a year apart.

Group B: two series given by nurses about a month apart (40 children rechecked by member of research staff because of "errors or omissions in recording").

2. To determine the relative importance of cycloplegic, another group of 25 children examined with and without cycloplegic using the same ophthalmological procedures and criteria as in the study (see 1 below under Findings).

3. To verify consistency of ophthalmological findings, 25 children of Groups A and B were re-examined without reference to previous findings (see 2 below under Findings).

4. Ophthalmological examination was given to all children in both groups who were classified according to the following criteria:

a. No recommendations: hyperopia up to +1 D.; hyperopic astigmatism up to +0.75 D.; compound hyperopic astigmatism up to +1 D. sph. with up to +0.75 D. cyl.

* This study is a part of the Research Learning Project sponsored by the Division of Child Hygiene, Massachusetts State Department of Public Health.

† Betts' Visual Sensation and Perception Tests, DB Series, Keystone View Company, Meadville, Pennsylvania.

- b. Refer if school work warrants*: hyperopia +1 D. to +2 D.; hyperopic astigmatism +0.75 D. to +1.25 D.; compound hyperopic astigmatism +1 D. to +1.50 D. sph. with up to +0.75 D. cyl. or up to +1 D. with +0.75 to +1.25 D. cyl.
- c. Examination indicated:
If uncorrected vision with simple myopia is less than 20/30 in each eye; with simple or compound myopic or mixed astigmatism is 20/30 or less.
If amblyopia is not improved to at least 20/30.
If exophoria for near or esophoria for distance exceeds 10 prism D. or if hyperphoria for distance exceeds 0.5 prism D.
If pathologic involvements are present.
If history of diplopia is given.
- d. Yearly check-up: those wearing glasses.

FINDINGS (Presented in tables and text without detailed analysis of either Betts or ophthalmological data; no effort made to compare telebinocular tests with their supposed ophthalmological counterparts):

1. Examination of 25 children of another group with and without cycloplegic resulted in a changed classification of only one child from "refer if school work warrants" to "examination indicated."
2. Re-examination of 25 children within a month revealed no changes in classification.
3. First and second telebinocular tests agreed in 81 per cent of the cases.
4. Whether scored by manual or "expert's" system, Betts tests failed many whom ophthalmologist passed.
Group A failures: manual score, 97; passed by ophthalmologist, 52; "experts'" score, 81; passed by ophthalmologist, 29
Group B failures: manual score, 89; passed by ophthalmologist, 73; "experts'" score, 55; passed by ophthalmologist, 42
5. Whether scored by manual or "expert's" system, Betts' tests passed some ophthalmologists classed "examination indicated." The figures for this were:
Group A: manual score, 3 (100 per cent of those classed as passing), "expert's" score, 5 (out of 19 classed as passing)
Group B: manual score, 1 (out of 11 classed as passing), "expert's" score, 4 (out of 45 classed as passing)

Visual-Acuity Tests.† S. S. Blankstein, M.D., and M. J. Fowler, M.D. *American Journal of Ophthalmology*, vol. 22, no. 12, Dec., 1939, pp. 1377-1382.

* In addition to referral if school work warrants, provision is made for referral of "borderline errors" if general health appearance indicates they may not be adequately compensated.

† Research under direction of Dr. E. V. L. Brown on grant from Keystone Company.

PURPOSE OF STUDY

To compare individual components of the Betts tests with comparable standard ophthalmic tests. This study reports on efforts to evaluate visual acuity portion of Betts tests as compared with standard Snellen test.

GROUP STUDIED

Clinic group of adults. 16-60 years of age	{	466 visual acuity recordings
		310 of individual eyes
		156 of both eyes together
School children 7-12 years of age	{	920 visual acuity recordings
		614 of individual eyes
		306 of both eyes together

TESTS AND TECHNIQUES EMPLOYED

1. *Snellen*: 20 feet; uniform illumination, intensity not specified; sufficient time was allowed to read individual letters "pointed out to them."

2. *Betts cards DBI, 2, 3*: stereoscopic apparatus; illumination as provided by manufacturer. When the vision in an individual eye was lower when the dots were presented to only one eye (both eyes open), then the binocular vision occlusion was used.

METHOD OF CONDUCTING STUDY

1. A table from the Keystone View Company publications is used showing the following ratios between Snellen values and Betts dot-arrangement values:

Betts	1	Snellen	20/200	Decimal*	0.1	A.M.A.†	20%
	2		20/150		0.13	percentage	30%
	3		20/122		0.16	efficiency	40%
	4		20/100		0.2		50%
	5		20/75		0.27		60%
	6		20/60		0.33		70%
	7		20/45		0.44		80%
	8		20/33		0.6		90%
	9		20/30		1.0		100%
	10		20/15		1.3		105%
	11		20/10		2.0		110%

* The decimal system is achieved by reducing the Snellen fraction and should not be interpreted as representing the degree of vision. As will be seen from the A.M.A. percentage rating of visual efficiency, 20/200=20 per cent vision, not 0.1 or 1/10 vision.

† A.M.A. Percentage Rating of Visual Efficiency: Report of Committee on Compensation for Eye Injuries: Appraisal of Loss of Visual Efficiency—Standard Method Approved by the House of Delegates of the A.M.A., May 26, 1925. *Transactions of the Section on Ophthalmology*, 1925, page 370. (While the article appears to attribute the entire table to the Keystone View publications, a separate reference is made to this source as the authority for the A.M.A. rating values. However, comparison of the rating values given in this reference with those quoted in the table above shows that in not all instances are the distance intervals identical and that the A.M.A. gives no percentage rating for 20/15 and 20/10. Reference to Betts "The Prevention and Correction of Read-

2. Accurate comparison between results of Snellen and Betts tests were difficult because of unequal spacing of steps. The decimal system† was therefore used in study to facilitate comparisons.
3. Results of comparison between Betts and Snellen tests are affected by the interpretation of what constitutes similar readings on each test. The figures were therefore interpreted and tabulated on two bases:
 - a. A difference in the two readings of less than 0.1†* was accepted as equal results for visual acuities of 20/33 or less and for better than 20/33 a difference of less than 0.2 was acceptable.
 - b. A difference in the two readings of 0.1†* was accepted as equal results with visual acuity of 20/33 or less and with better than 20/33 a difference of 0.2 was acceptable. The latter represented a more liberal allowance since one whole Snellen line of difference was considered necessary for a disagreement between the tests whereas in the former less than a line was used.
4. In using Betts test occlusion was practiced to obtain best results where indicated (see Techniques).

FINDINGS

1. The two bases of comparison used give marked differences in results.
 - a. Analysis of results was made on basis of percentage agreement, percentage higher visual acuity with Snellen and lower visual acuity with Snellen. With the more liberal allowance (see above Methods 3b) the greatest agreement of individual eye tests was 67 per cent in adult group and 75 per cent in child group; of binocular tests 78 per cent in adults and 69 per cent in children.
2. Betts charts are not an accurate measurement of visual acuity compared with Snellen charts and especially in measuring subnormal acuity.
3. In determining the presence of normal vision, the two tests were in close agreement in single-eye tests.
4. Suppression is a frequent factor in Betts tests and a small factor in Snellen tests.
5. Age is not a contributing factor in the difference between Betts and Snellen findings.
6. Both methods take about the same length of time.

ing Difficulties" Row Peterson and Company, Evanston, Illinois, shows that he frequently compares the Betts distance values with A.M.A. percentages, and in a publication of the Keystone View Company entitled "Data on Visual Sensation and Perception Tests Part II" by Betts, he gives the Snellen fraction ratio to percentage of visual efficiency as quoted above.)

* See table under Method, 1, p. 141.

† See first footnote, p. 141.

Evaluation of Three Methods Commonly Used in Examination of Eyes of School Children. B. C. English, B. C. Shmukler, M.D., and A. Cowan, M.D. *Archives of Ophthalmology*, vol. 22, no. 6, Dec., 1939, pp. 1068-1073.

PURPOSE OF STUDY

To evaluate three common methods of screening for visual defects of school children.

GROUP STUDIED

485 school children, 8-10 years of age, third grade.

TESTS AND TECHNIQUES EMPLOYED (A child considered failing unless he "reacted normally" to all of the tests by any one of the three methods of testing):

1. *Betts' tests*.*

2. "*N.E.A.M.A.*" method.† (Very specific directions for technique; no definite statement of limits of normal for visual acuity.) Snellen at 20 feet; not less than 10 foot-candles of illumination evenly distributed over chart; no glare within child's field of vision, chart at eye level. Symptoms (a specific list including observations of reactions to test, appearance of eyes and lids and history of difficulty with vision or reading).

3. *School medical inspection*. Snellen at 20 feet; chart hung on wall against dark background at eye level (illumination not specified). Symptoms (inspection of lids, conjunctiva, cornea, and eyeball).

4. *Ophthalmological examination* (criteria for normal not stated). Pre-cycloplegic, cycloplegic, and post-cycloplegic tests: visual acuity, inspection of external appearance, ophthalmoscopic, muscle balance (distance and near), duction, accommodation, stereopsis.

METHODS OF CONDUCTING STUDY

1. Entire group given all three of the tests listed above; 111 given ophthalmological examination:
 - a. 91 who had failed one or more of the preliminary tests.
 - b. 20 who passed all preliminary tests.(Method of selection of these two groups not indicated.)
2. Betts' and N.E.A.M.A. tests given by same school nurses.
3. Ophthalmological examination given without access to data from preliminary tests.

* Betts' Visual Sensation and Perception Tests, Keystone View Company, Meadville, Pennsylvania.

† Conserving the Sight of School Children: Report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association with the co-operation of the National Society for the Prevention of Blindness. Publication 6, National Society for the Prevention of Blindness, 1790 Broadway, New York City. (Directions for this test are distributed by the National Society for the Prevention of Blindness under the title of "Eye Inspection and Vision Testing"; available on request.)

4. Betts series and findings from ophthalmological examination presented in summary form. (Data presented do not permit comparison of findings regarding various aspects of visual functioning.)

FINDINGS

1. Of 485 children tested:
 - a. 184 passed all three tests.
 - b. 40 failed all three.
 - c. 301 failed one or more.
 - d. 77 failed school medical inspection.
 - e. 124 failed N.E.A.M.A.
 - f. 260 failed Betts.
2. Ophthalmological examination confirmed the absence of ocular defects in 20 children who had passed all three of the preliminary tests.
3. Ophthalmological examination of the 91:
 - a. Confirmed the presence of ocular defects in
 - (1) 35 of 79 children who failed Betts tests.
 - (2) 35 of 43 who failed N.E.A.M.A.
 - (3) 25 of 38 who failed school medical.
 - b. Detected ocular defects in
 - (1) 7 of 12 who passed Betts.
 - (2) 7 of 48 who passed N.E.A.M.A.
 - (3) 17 of 53 who passed school medical.
4. N.E.A.M.A. method most dependable of the three; of the 7 children missed by Betts, 4 were picked up by N.E.A.M.A. because of symptoms (these all had correctible amounts of hypermetropia) and 2 because of failure on Snellen (these and one other missed by both N.E.A.M.A. and Betts had "correctible amounts of myopia").
5. School medical inspection as routinely practiced "unreliable."

Case-Finding Procedures Developed by the Astoria School Health Study. George M. Wheatley, M.D. *The Child*, vol. 4, nos. 11 and 12, May-June, 1940, pp. 283-291.

PURPOSE OF STUDY

The major purpose was to adapt school health service to changing medical and educational concepts. One section aims:

- a. To allocate responsibility for selection and follow-up of pupils with visual defects.
 - b. To determine reliability of teacher selections.
 - c. To institute follow-up procedures.
- (Only this section included in abstract).

GROUP STUDIED (In vision screening program):

School children in Astoria (New York City) public schools. (No further description of group except that they apparently were second grade

or above and that figures are analyzed for "results of vision tests of 6,889 children.")

TESTS AND TECHNIQUES EMPLOYED

Snellen (no techniques given). Basis of referral 20/40 or less.

METHODS OF CONDUCTING STUDY

1. Teachers gave vision tests in their classrooms; referred to nurse those with 20/40 or less vision.*
2. In first part of study nurse "rechecked under standard conditions" all those referred; later nurse rechecked only those with 20/40.
3. Those with 20/40 or less and "the best possible correction" advised to return to person who prescribed glasses for periodic re-examination. (No indication as to how it is determined that present glasses represent "best possible correction.")
4. Evaluation of reliability of case selection on the basis of
 - a. Comparison of teacher's findings (classroom conditions) with nurse's findings ("standard conditions").
 - b. Substantiation† of referrals by teacher and/or nurse by oculists or optometrists.

FINDINGS

1. On the basis of nurse's recheck of referred cases: teachers' selections of those with visual acuity of 20/50 or less found reliable while selection of those with 20/40 was reliable in only 40 per cent of the cases.
2. On the basis of return reports from examiners ("optometrists, oculists and so forth"): nurses' referrals of teacher-selected cases of 20/50 or less and her own rechecks of 20/40 or less "substantiated"† in 95 per cent of cases; 100 in first class number, not stated for second.

As a result of the study, procedures were revised as follows:

1. Teachers test all children (apparently "from second grade on") and refer to nurse those who have visual acuity of 20/40 or less in either eye.
2. Nurse rechecks only those with 20/40.
3. Nurse follows up for correction those with 20/50 and those for whom her recheck confirms 20/40.

(Figures are presented for four half-years to show diminishing percentage with 20/40 or less, diminishing case load for follow-up by nurse, and increasing percentage with 20/40 or better with or without glasses).

Methods for Visual Testing in Schools. J. B. Hitz, M.D. *Archives of Ophthalmology*, vol. 24, no. 2, Aug., 1940, pp. 221-224.

* In a personal interview, Dr. Wheatley told me that approximately 1,000 children were given a Snellen test in classrooms under conditions identical with those used by teacher and agreement of findings was very high. This is not mentioned in report.

† The method of substantiation by examiner is not explained; may mean reports received corroborating findings or that glasses were found necessary for these children.

PURPOSE OF STUDY

To evaluate some of the present methods of screening for visual defects used in schools.

GROUP STUDIED

745 school children, 8-16 years of age.

TESTS AND TECHNIQUES EMPLOYED

1. *Snellen*: at 20 feet; illumination 20 foot-candles; limits of normal 20/30 or better.
2. *Betts tests*:*
 - Limits of normal:
 - a. Scored on basis of Betts' text.
 - b. Scored on percentage basis† (5-10 per cent reduction for each failure, 75 per cent for all tests passing).
3. "*Hitz ophthalmic group*"

Snellen: standards as above.
 Worth Four-Dot at 6 meters and at 33 cm. (Each dot subtends 13.3 minute visual angle; distance between dots 40 minute angle.)
 Standards for normal—fusion at distance and near.
 Duane Screen at 6 meters and at 33 cm. (sometimes called alternate cover test for muscle balance).‡
 Standards for normal—At 6 meters, no consistent in or out movement; at 33 cm. no outward movement, inward movement neutralized by 5 D. prism base in.

METHODS OF CONDUCTING STUDY

1. All tests given to all children by three lay testers (3 hours' individual instruction).
2. Comparisons made between Betts tests (scored according to Betts standards and according to percentage scale outlined above) and the Snellen alone and also between the Betts tests of each function with its counterpart in the "Hitz ophthalmic group."
3. Order of tests alternated to exclude fatigue factor.

FINDINGS

1. Comparison of Betts' test with Snellen alone and with "Hitz ophthalmic group":

<i>Test</i>	<i>Passed</i>	<i>Failed</i>
Snellen.....	89.7%	10.3%
Betts (scored on Betts standard).....	17.4%	82.6%
Betts (scored on percentage scale).....	58.4%	41.6%
"Hitz group".....	55.4%	44.6%

* Betts' Visual Sensation and Perception Tests, DB Series, Keystone View Company, Meadville, Pa.

† "Davenport Iowa Method."

‡ See digest of "The Vision of Pre-School Children—An Analytical Study of 982 Children," SIGHT-SAVING REVIEW, Vol. XI, no. 1, March, 1941, p. 47.

2. Degree of agreement between Betts tests of each visual function and its counterpart in the "Hitz ophthalmic group":

	Snellen	Worth	Duane
Results with Betts tests agreed with	90.5%	53.5%	68.9%
Failed Betts—passed other	8.0%	35.3%	26.4%
Passed Betts—failed other	1.5%	11.1%	4.5%

3. Time: Betts' tests took almost twice as long to give as "Hitz ophthalmic group."
4. Snellen alone misses many cases—fusion and muscle difficulties.
5. Betts tests "too discriminating" and do not correlate with accepted and comparable ophthalmic tests.
6. Use of stereoscope introduces psychic factors which inhibit normal binocular vision.

Massachusetts Vision Test. An Improved Method of Testing Eyes of School Children. A. E. Sloane, M.D. *Archives of Ophthalmology*, vol. 24, no. 5, Nov., 1940, pp. 924-939.

PURPOSE

To develop a screening procedure for use in schools.

GROUP STUDIED

1. Introductory tests: Groups varied in size, description omitted.*
2. "Massachusetts Vision Test":
 - a. 313 school children, 7 to 15 years of age (1938-39).
 - b. 3,430 school children (age not specified) (1939-40).
 - c. 278 school children—Weston.
3. For "out-of-state" tests: 90 school children.

TESTS AND TECHNIQUES EMPLOYED

1. Introductory tests:
 - a. Positive relative accommodation: a pair of spectacles with -3 D. sphere to read 20/20.
 - b. Prism convergence: a pair of spectacles with 6 prisms; the 20/200 letter fixed; if seen singly, the influence of prisms was successfully overcome.
 - c. Stereoscope for single binocular vision and phorias.
 - (1) Split E card for single binocular vision.
 - (2) Horizontal phoria evaluated by using a card with calibrated rectangular enclosure for right eye and small ball for left.
 - (3) Vertical phoria same with smaller ball test for displacement above or below line tested at near and distance.

* Emphasis in study is on procedures of "Massachusetts Vision Test"; contributory data not fully presented.

2. "Massachusetts Vision Test":

- a. Snellen at 20 feet, using 3 special charts with the 20/20 and 20/30 lines, 8 symbols per line and one line of 4 symbols ranging from 20/100 to 20/40. Artificial illumination, two 25-watt bulbs. (Methods of placing and shielding bulbs not indicated.) Chart illumination: 16 foot-candles. Limits for passing: 20/20-2. Retested all who failed, preferably by another person. One child in room at a time. Each eye tested separately and both together.
- b. Snellen charts as above with +1.50 D. sphere in spectacle frames. Child closes eyes, then opens to read 20/30 line. If 20/30 read successfully, tries 20/20 which, if read, indicates failure.
- c. Maddox rod. Two pairs of spectacles, each containing a red Maddox rod for right eye—vertical and horizontal.
 - (1) Heterophoria for distance at 20 feet. Fixation object a 5-watt nonfrosted bulb projecting through window of pictured house, calibrated to equal 6 prisms of esophoria, 4 prisms of exophoria, 1.25 prisms of hyperphoria.
 - (2) Heterophoria for near. Block attached to a 16-inch cord with pencil flashlight seen through pinhole aperture calibrated to 6 prisms of esophoria, 8 prisms of exophoria. Block is kept at 16-inch distance by placing one end of the cord at the eye and holding the block directly in front and the length of the cord from the eye.
- d. Ophthalmological examination with and without cycloplegic (group 2-a only). (Ophthalmological tests and techniques not indicated.)

(Techniques for administration are outlined in detail, even as to phrasing of key questions.)

METHODS OF CONDUCTING STUDY

1. Introductory tests tried out and eliminated. Test No. 3 (stereoscopic) was tested against (a) "routine phoria test by staff ophthalmologist" and (b) Maddox rod by technician.
2. "Massachusetts Vision Test"
 - a. Failure to pass any test indication for omitting remainder.
 - b. Test given to groups 2-a and 3 by ophthalmologist and technician, groups 2-b and 2-c by teachers and nurses only.
 - c. Comparative data for group 2-a are limited to analysis of percentage passing or failing "Massachusetts Vision Test" in relation to percentage failing ophthalmological examination. Figures are given showing those passed by ophthalmologist and failed by the component parts of "Massachusetts Vision Test."* For group 3, a limited comparison is made between the comparative ophthalmological examination and "Massachusetts Vision Test." Group 2-b analyzed on basis of percentage failing each component test of the "Massachusetts Vision Test." Group 2-c specially scored and analyzed on same basis as for group 2-b.

* Because of elimination practice stated above (see Method 2-a), these figures cannot be interpreted since the numbers originally taking or failing component tests are not stated and must in some cases be extremely small.

FINDINGS

1. Introductory tests all eliminated; 1-a eliminated as giving unsatisfactory results on first trial; 1-b because it screened out only one of 350; 1-c as misleading to lay people, presenting psychological sense of nearness and because a poor stereoscope introduces errors and a good one is expensive.

When compared with ophthalmological findings for Snellen test, teachers showed disagreement in 3 times as many cases as trained technicians.

When properly administered, "Snellen is the single most effective procedure for detecting children who require attention of ophthalmologists."

2. "Massachusetts Vision Test"—In group 2-a, 9 per cent of those passed by ophthalmologist (161) were failed by the "Massachusetts Vision Test"; 2 per cent of those failed by ophthalmologist (87) passed "Massachusetts Vision Test"; in group 2-b (3,430), 43 per cent failed "Massachusetts Vision Test," 32 per cent Snellen, 7 per cent sphere, 4 per cent Maddox; in group 2-c (see Method 2-c for scoring), of 278, 28 per cent failed, 21 per cent Snellen, 5 per cent sphere, and 2 per cent Maddox; in group 3, of 90, 19 failed by ophthalmologist because of refractive errors, of whom 15 also failed "Massachusetts Vision Test"; 2 failed by ophthalmologist because of heterophoria, one of whom also failed "Massachusetts Vision Test."

The Forum

THIS section is reserved for brief or informal papers, discussions, questions and answers, and occasional pertinent quotations from other publications. We offer to publish letters or excerpts of general interest, assuming no responsibility for the opinions expressed therein. Individual questions are turned over to consultants in the particular field. Every communication must contain the writer's name and address, but these are omitted on request.

Headaches Due to Eyes*

A headache that is not present in the morning but comes on gradually during the day and is worse by evening is usually an eyestrain headache. If additional information is elicited that the headache occurs after prolonged use of the eyes, such as reading or going to shows, it is pretty definitely so. Unfortunately all eye headaches are not so typical. Headaches due to eyestrain and eye disease constitute a large majority of all headaches. The percentage figures vary a great deal among different authors. It is placed at anywhere from 25 to 85 per cent.

The fact that a person has 20/20 vision in each eye does not mean necessarily that he may not have eyestrain. Small errors of astigmatism often cause headache and eye-

strain, while a person may have more than a diopter of astigmatism and merely get glasses because of poor vision and not because of headaches. The fact that a person wears glasses does not exclude this as a possible cause of headache, or the fact he has had a recent change of glasses does not always exclude it as a cause.

People under forty-five who are not myopic should have an examination under a cycloplegic, provided the tension is normal and the fundus is examined first. Of those who are myopic, the refraction will be more satisfactory if done twice, once with cycloplegic and once without.

A person having hyperopia, who does not have relief of the headache immediately or within a few days after obtaining glasses, should not be too critical and condemn the glasses or the doctor, as it takes several weeks in some instances to

*Extracted, with permission, from an article entitled, "Headaches," appearing in the November, 1940, issue of *Northwest Medicine*.

produce relaxation of ciliary spasm and fatigue.

Muscle errors also cause considerable headache. No refraction is complete that does not measure these factors. The vertical phorias are more inclined to give rise to headaches than other types, even when the error is not great. Exophoria is more inclined to give rise to headache than esophoria in my experience, because of the additional load on convergence for near work. Convergence excess when mixed with astigmatic errors, as it usually is, does produce headache.

Ciliary weakness or fatigue can be measured by the accommodation tests. It is relieved by correct wearing of proper glasses but is often found to be aggravated by very many conditions elsewhere in the body, such as the toxins from bad teeth or tonsils, thyroid disturbances, blood dyscrasias, and many others.

Ciliary spasm is created by trying to accommodate too much. It is usually found in the farsighted person and is also relieved by correct glasses.

A different size image in one eye as compared to the other creates confusion of the images in the brain. The complex attempt to produce adjustment creates headaches of variable intensity.

Glaucoma is one of the less common causes of headaches because incidence of the disease is not so great in proportion to the number

of headaches. It is one of the leading causes of blindness and may be easily overlooked in the incipient stage, as there is no redness of the eyes and the cupping of the discs has not yet occurred. In glaucoma, the headache is dull or intense and is as often in the back of the neck or occiput or in the temples as it is in the eyes and forehead.

Disease of the retina, choroid and media are free of headaches. Disease of the lids and lacrimal apparatus do not give rise to headaches. It is quite commonly stated that myopia does not produce headache. In my experience there is considerable error in this, and, since becoming interested in the subject of headaches, I have paid particular attention to this and note that myopic patients often are relieved by correct glasses. It may be that, in an effort to get better vision, they compress the eyeball with the lids and set up a headache of neuromuscular fatigue.

—EDWIN D. WARREN, M.D.

Tacoma, Washington

Parents—Look to the Eyes

The home and the parents in that home are the most important elements in maintaining efficient eyesight because they have the opportunity of observing their children at all times of the day and year. Early in the morning, do they come to breakfast clear eyed and rested, or are Mary's eyelids red and puffy?

And later at night, does John rub his eyes and wiggle his book around to get the right light on his work? Parents are in the key position to watch for changes. They also set the stage by providing the physical setting, chairs, lights, sleeping quarters, and diet—all important elements in keeping the eyes functioning at their maximum capacity and with the greatest ease and comfort. The parents' attitudes on doctors, on care of eyes, affect the eyes of their children vitally. In other words they are all important in maintaining the efficient eyesight which they and their children need for living.

The day of the naked bulb hanging by a cord from the center of a room is gone. Today the modern home is well equipped with windows, light fixtures, and light sockets in the correct places. All we have to do is use them effectively. To do this a few simple rules are necessary, most of which are generally already known: suit the amount of light to the job to be done and the condition of the eyes; dark furniture, drapes, and walls cut down the light; light colors reflect light.

Daylight is diffused light, and it is well to try to approximate this with artificial lighting. Fifteen foot-candles of light have been found to be most comfortable with which to read. This can be discovered by using the light meter—found in homes of camera lovers. A 100-

watt bulb is generally best for reading. Light should be free from glare, harsh contrasts, and shadows. Mirrors, pictures, and shiny furniture often create a glare. Light should come over the left shoulder for right-handed persons and over the right shoulder for the left-handed person, and its source should be above the level of the eyes. (The indirect lamps sold today, labeled I. E. S.—Illuminating Engineering Society—are properly designed for good illumination.) Reading materials are best on dull paper, black print, wide margins, even print—especially mimeographed material.

Furniture in the home should be movable. That means that if light isn't right for John to study by, he should be permitted to move his desk or lamp around so that it is right. No one should stare directly into a light or a window.

Good lighting cuts down accidents in the home, particularly on cellar steps, laundry, kitchen, and bathroom. Generally speaking, then, uniform light spread over the whole ceiling, with light on book or work, sufficient for comfort and safety, is the best type of lighting.

Efficient lighting is important because the act of seeing is just like taking a picture with a camera. In taking a picture the light is reflected from the object, goes through the shutter, is deflected by the lens on to the plate or film, setting up a chemical reaction. In seeing, the light reflected from the object goes

through the pupil, is deflected by the lens on to the retina or optic nerve, setting up a chemical reaction. In taking a picture, if the focus is inaccurate, a blurred picture results. This is what happens in the case of the nearsighted or astigmatic eye or cross-eyed persons—the point of focus is inaccurate. In the nearsighted it is in front of the lens, in the farsighted, behind, and the astigmatic rays are irregular. If the light is not adequate, dull pictures result; if spotty, a streaked picture results, but if bright and well focused, a sharp picture with clear outlines will be seen.

If two cameras are placed a few inches apart, an overlapping picture will result. That is exactly what eyes do. It is this overlapping in the center which gives the sense of depth or distance.

The cross-eyed person or person who uses one eye does not have this appreciation of depth. That is true particularly of the child who has never used more than one eye. The use of one eye limits the field of vision. This is one of the reasons for early correction of cross-eyes. The one-eyed driver has his range of vision reduced by about 40°—compensated for by turning his head.

The perfect eye is able to take from 12 to 14 pictures and send these pictures to the brain every second. This speed of seeing is reduced by half when only one eye is used.

Another thing which reduces speed of seeing is lack of visual purple, which is the chemical released in the retina by light. Science is not quite certain of all the steps in this chemical action, but it has been proved that certain vitamins seem to affect the efficiency of this procedure—Vitamins A and G particularly. Vitamin G is found in yeast and yeast products, milk, eggs, and leafy vegetables. Vitamin A is found in butter, cream, cod and halibut liver oil, beef fat and nut oils; meats, such as kidney, heart, glands, brain and sweetbreads; fish, especially salmon, and fish roes; milk—whole raw, sweet condensed—and whole milk cheeses; eggs and fresh vegetables, particularly the carrot and sweet potato—fresh and raw—cabbage, spinach, lettuce and bananas. We all have heard of carotene; it comes from the lowly carrot and is essential for visual acuity.

Dr. Parran, Surgeon General of the United States Public Health Service, recently told of an experience he had in Denmark directly after the World War. He visited a home with 600 blind children. On inquiring into the cause of blindness, he was told that these children had been fed on milk, egg, and butter substitutes during the war, and Denmark had literally sold the sight of her children. These were, of course, extreme cases of avitaminosis. The earlier evidences are watery eyes, red lids, blurred vision

and night blindness. Vitamin G deficiency causes loss of eyelashes, conjunctivitis, and a pasty condition of eyelids in animals. Today bananas have been added to diet of infants and old people, and in the latter case Vitamin G is believed to decrease cataract. Nutrition is very important in the young child and pregnant mother, and to eye health all through life.

The normal eye in infancy is farsighted; in youth through 40-45, the eye adjusts readily to near or far work; after that it becomes presbyopic—that is, the lens thickens slightly and the muscles adjust less readily. Any deviation from these norms is cause for examination.

Indications of eyestrain are headaches, light sensitiveness, watery eyes, sties, itchy lids, irritability. Scowling at the page when reading or writing and the blurring of the page are typical signs that something is wrong.

The cause may be focal infection, sinus, infected tonsils, or general run-down condition. The thing to do, of course, is find the cause. For general checkup see the family physician, who will refer you to the proper specialist for an eye examination. If funds are low or budget won't permit, the eye, ear, nose and throat hospitals are excellent. They give good care at a minimum cost.

If glasses are prescribed, be sure your child wears them. If they are for reading only, don't allow them

to be used at the movies. And be sure they are clean and sitting correctly on his nose, not tipped forward or to one side. The parent has a task in making his child use glasses, especially at first. Help him—don't make fun of him, don't nag him, but see that they are placed where he will see and use them.

Sun glasses, by the way, should be used as little as possible. Hats protect the eyes and also the head and back of the neck, which is important in extreme heat and sun. The fad of sun glasses has been overdone. Use them only on beach, water or in snow. Supersensitiveness to light is a symptom—needs treatment, not sun glasses.

The job of getting the myopic child away from books often stumps many parents. These children generally love to read and start early because they do it more easily than anything else. They need social activities in which they can participate with others. The wise parents plan these activities. Not the movies, but such things as hikes, picnics, family parties, dances, lectures, Sunday school activities, and clubs, such as the Boy Scouts, provide outlets. If he is interested in sports and must wear his glasses when playing, get him an eye guard. And coming back to the movies—be sure they are clear movies. Old films often shimmer and are light streaked. This applies to home-shown, school films and commercial ones as well.

In conclusion, early discovery and treatment are important in cases of eye defects and eyestrain. Good light should be judged by the ease and comfort with which you can do a specific job. It should be general, indirect, and come from above the eye level. Remember the left-handed child—light should come over his right shoulder. Intensity of 15 foot-candles is found to be the most comfortable. Vitamins G and

A, rest, and relaxation, all are important in maintaining good eye health. The best is not too good for the eyes—have them examined periodically.

Again I say, good vision is a valuable possession—essential for safety, success and happiness in the world today. Help your family keep it!

—ALMA EBELING
Washington, D. C.

News of State Activities

THIS Section is devoted to the reporting of sight conservation activities carried on by official and voluntary agencies throughout the country. It presents information supplied by these groups, and serves as a medium for exchange of experiences. Only brief and timely items can be used, because of the limitations of space.

Colorado

"During April and May of 1941, 555 children of school and pre-school age were given diagnostic examinations by ophthalmologists in sight conservation clinics, sponsored by the Division of Maternal and Child Health of the Colorado Division of Public Health in co-operation with the Colorado Ophthalmological Society and certain local county organizations. The clinics served five counties and included eleven clinic days. The ages of the children examined ranged from one to twenty-two years of age with a median age of twelve years, six months.

"According to the plan, preliminary screening was done by the local public health nurses and school teachers. Any child with visual acuity of 20/30 or less, or any child having subjective symptoms such as excessive lacrimation, blurring, secretion, unusual posture, et cetera, was considered eligible for the diagnostic examination. Refraction appointments were arranged on the basis of medical and financial need.

"Out of the total number of children examined, refractions were recommended for 441. Two hundred twenty-three children were refracted. Of this number, 173 had glasses prescribed; lenses were not prescribed for 41, post cycloplegia examinations were recommended for six and the present lenses of 13 children were considered satisfactory. The procuring of glasses for the medically indigent usually presents quite a problem. However, through the active participation of the local welfare departments, service clubs, such as the Elks and Lions, the American Legion Auxiliary, and private welfare groups, every child was fitted with the prescribed correction. Follow-up services will be given by the local public health nurses and welfare workers with the medical social consultant of

the Division of Maternal and Child Health giving consultation and direct service where the needs indicate."

—*Division of Maternal and Child Health, Colorado Division of Public Health, Denver, Colorado*

District of Columbia

"With the end of the school year the District of Columbia Society for the Prevention of Blindness brings to a close its fourth vision testing program.

"Volunteers trained under the direction of the Society carry on this commendable work and cannot be praised too highly for their faithful and indefatigable efforts.

"Preschool children in the Child Hygiene Centers of the Health Department were given 697 vision tests. Sixty-nine youngsters were referred for eye examinations as having vision less than 20/30.

"In the parochial schools, 4,463 pupils received vision tests and 845 of them were found to have vision less than 20/30.

"It is interesting that the percentages for these recent totals repeat those of former years, namely, among school children nearly 20 per cent have subnormal vision in contrast to 10 per cent for preschool children."

—*District of Columbia Society for the Prevention of Blindness, Washington, D. C.*

Illinois

"The Illinois Society for the Prevention of Blindness has been working all winter on the enactment of an improved Fireworks Bill for the State of Illinois.

"House Bill 70 was introduced at the Illinois Legislature on January 20. The Bill remained in Committee until the 25th of March. Committee amendments which allowed the retail sale of sparklers and flower-pots were added to the Bill. Also, the enforcement of the law was switched to the local governmental units from the Fire Marshal's Office, for the reason that the Fire Marshal in Illinois only has fourteen assistants to cover the 102 counties of the State.

"The Bill passed the House on April 29 by a vote of 100 to 12. It came out of the Senate Committee on May 21 with a recommendation to pass. It is hoped that it will be speedily enacted into law."

—*Illinois Society for the Prevention of Blindness, Chicago, Illinois*

Minnesota

"*Fireworks Banned in Minnesota.*—The legislature of the State of Minnesota passed an act prohibiting the use of fireworks after

this act becomes effective. Many civic organizations interested in accident prevention, sight-saving, health and public welfare, united to support the bill, directed toward protecting the life and limb of Minnesota's children. In spite of the considerable opposition, this bill was successfully passed by the legislature to take effect August 1, 1941, and should go a long way toward reducing the amount of blindness caused by the preventable Fourth of July accidents.

"Minnesota has set an example which other states could do well to follow."

—*Minnesota State Department of Health, St. Paul, Minnesota*

"*Activities to May 1, 1941.*—The Minnesota Fireworks Control Law is a good one, and goes into effect August 1, 1941. Its passage has been so close to the heart of the State Society for the Prevention of Blindness that we feel responsible for getting it through, although innumerable other groups participated.

"The educational program has continued with P. T. A. meetings, articles published in rural newspapers, radio interviews, and a speaker, Dr. William O'Brien of the Medical School of the University of Minnesota, at the State Conference of Social Work in May.

"Cash prizes have been offered for posters on 'Care of the Eyes' made by members of 4-H Clubs of the state. Prize-winning posters will be exhibited at the State Fair. Provision for vision testing for club members will be a feature of our work in the 4-H Building.

"During the summer the Society plans to send an ophthalmologist, two nurses, a medical social worker, and a clerical assistant to a selected county to make a survey of the eye conditions of all children in that county. With the results of this survey as an index, the Society will urge the organizing of county chapters to facilitate plans to meet local needs in conservation of vision.

"Registrations for the summer course for nurses to be given with the co-operation of the National Society are now being taken by the Department of Preventive Medicine and Public Health of the University of Minnesota."

—*Minnesota Society for the Prevention of Blindness and Conservation of Vision, St. Paul, Minnesota*

New York

"An Institute on Conservation of Sight was held in Utica at the Hotel Utica on May 1 and 2. The Institute was arranged by the New York State Commission for the Blind, through its Prevention

Service, and in co-operation with the Central Association for the Blind of Utica.

"This Institute brought before the educational, health, and social welfare groups of the community some of the means through which sight might be preserved and also explained the relationship of the various agencies within the State concerned with the prevention of blindness. Through this medium an increased interest was stimulated in the conservation of sight. Members of professional and lay organizations as well as the general public attended.

"An address of welcome by the Honorable Vincent R. Corrou, Mayor of the City of Utica, opened the Institute. 'How the Eyes See' and 'Public Health Measures Which Safeguard Sight' was offered by members of the medical profession. At the dinner meeting 'The Responsibility of the State to Prevent Blindness' was discussed by Commissioner of Social Welfare David C. Adie, preceded by an ophthalmological presentation of 'The History of the Sight Conservation Movement.'

"The program concluded with a luncheon at which 'The Art of Illumination' was demonstrated, and health measures in industry were discussed by experts in their fields."

—*Prevention of Blindness Service, Bureau of Services for the Blind, New York State Department of Social Welfare, New York, N. Y.*

South Carolina

"South Carolina passed legislation in 1939 making it mandatory to instill a prophylactic in the eyes of new-born infants. It then became necessary to have new birth certificates in order that there might be a designated place for recording this function.

"The State Department of Public Health has co-operated in every respect with the Division for the Blind, and in consequence we have been permitted to review all birth certificates. The medical social worker has just completed reviewing all certificates which have been compiled this year.

"It was noted that many old certificates were still being used. A complete report of our findings was submitted to the State Department of Public Health. This included names of counties in which old certificates were being used, names of the midwives using old certificates, and names of midwives failing to record the use of a prophylactic.

"As result of these findings, the Health Department will make every effort to collect all old certificates. The midwives who fail to properly fill out the certificates will be reported to their respective county unit, who will contact them and see that they are supplied with new certificates, and further instruct them in the filling

out of these. In the event they continue to fail to co-operate in this respect, their license will be revoked.

"The Health Department has been forwarding the Division all cases of ophthalmia neonatorum which have been reported to them. These cases have been followed up, and in instances where the treatment was not being given, arrangement was made for the necessary treatment.

"We are delighted to note that since the passage of the above mentioned legislation there has been a gradual decrease in the number of cases of ophthalmia neonatorum reported. We cannot be too optimistic about this, however, as we realize there are probably many cases which are never reported, so we do not dare let up in our effort to locate these cases.

"In studying the medical reports which continue to come in, we note an increase in cases of blindness resulting from syphilis. All these cases are referred to their respective counties with the request that the client receive antiluetic treatment, and Wassermanns be made on members of the family. The Department of Public Health also co-operates in these services.

"The Division for the Blind has been responsible for 94 operations since the beginning of our new year, July 1, 1940. We plan to forward a report on these when we submit further material."

—Division for the Blind, State Department of Public Welfare,
Columbia, South Carolina

Tennessee

"*Sight Conservation Activities In Tennessee From February 14, 1941, to May 12, 1941.*—During this three-months' period five of our Lions Clubs have begun co-operative programs in sight conservation with the Service, four being visual corrective programs for indigent visually handicapped children and one being a sight-saving class program. The clubs beginning visual corrective programs are: the Hartsville Club of Trousdale County, the Murfreesboro Club of Rutherford County, the Erin Club of Houston County, and the Decatur County Lions Club. The Chattanooga Club has begun work on a sight-saving class project, this class to be established in September of this year in Chattanooga, and has agreed to pay for the training of a teacher for this class, as well as to provide the necessary equipment.

"During this period 72 persons, 58 being children and 14 being adults, have had varying amounts of sight restored to them in one or both eyes, 66 of these restorations being accomplished by glasses alone, 5 by surgery and glasses, all being adults, and one by surgery alone, being a child. Seven other persons, 4 being children and

3 being adults, have had cataract surgery to restore sight, 5 being for congenital cataracts and 2 being for senile cataracts, but the amount of sight restored to these persons is not yet known.

"Also, total or partial blindness in one or both eyes either has been or is being prevented for 37 persons, 33 being children and 4 being adults. The causes from which blindness either has been or is being prevented in the cases of the children are: amblyopia exanopsia, with high hyperopia or myopia in 29 cases; trachoma in 1 case; traumatic iritis and secondary glaucoma in 1; and possibly progressive myopia in 2; and in the cases of the adults: 2 from pterygia by surgery; 1 from corneal ulcer by local treatment and the extraction of infected teeth; and 1 from diabetes by treatment.

"Seven talks have been made by the Director, one before a group of senior medical students at Vanderbilt University on 'The Causes of Blindness in the State and Their Prevention' and six on co-operative programs in sight conservation for Lions Clubs, before the Lions Clubs of Murfreesboro, Decaturville, Erin, Memphis, Knoxville and Greeneville, and the results have been most gratifying, since three of these clubs have begun visual corrective programs with the Service. Two others, the Memphis and the Greeneville Clubs, have agreed to begin visual corrective programs and the Knoxville Club has agreed to place before its Board of Directors a project for the establishment of a sight-saving class for Knoxville. Plans are being made to visit all of our sixty-four Lions Clubs as quickly as this can be done, and it is hoped that each of these clubs will adopt either a visual corrective or a sight-saving class project."

—*Sight Conservation Service, State Department of Public Health,
Nashville, Tennessee*

Note and Comment

New Experiments Reveal That Fear and Rage Affect Vision.—

Confirming the belief that rage or fear can "blind" you, Dr. E. I. Strongin, Mrs. N. Bull, and Dr. B. Korchin of the College of Physicians and Surgeons of Columbia University, have recently shown that vision is not the same under emotional strain as it is when one is relaxed. Motion pictures taken of the eyes of persons reading showed that, while 36 per cent of them could see better when emotionally roused, 22 per cent became worse under the strain. Even more critical was the test for binocular function; from 14 per cent to 22 per cent of those tested became worse under stress of emotion, while only four per cent improved under the excitement. The test of how the two eyes work together is particularly important with regard to the motorist who is trying to gauge the speed of an approaching car, or for the airplane pilot who, returning from an exciting and fatiguing flight, tries to land his speeding plane in a small field.

The scientists recommend that men whose duties will require them to use their eyes under powerful emotional strain, as in fighting or any hazardous situation, should have their vision tested under emotional conditions rather than in the quiet of a doctor's office.

Industrial Workers and Artificially Lighted, Windowless Buildings.—Artificially lighted, windowless industrial buildings, designed for "blackouts" in case of war, if equipped with great care need have no harmful effects on the eyes of workers, nor should they produce any significant tendency to claustrophobia (fear of being shut up in a confined space), *The Journal of the American Medical Association* for November 30 says, in answer to an inquiry.

"The long time use of artificial lighting to the exclusion of all natural light may have a harmful effect on the eyes of workers," *The Journal* says, "but foremostly because of the inadequacy or unsuitability of the artificial lighting provided. Until recently there has been no form of artificial lighting that compared favorably with

daylight. Even now statements as to parity must be accepted with reserve. However, with the advent of fluorescent lighting, with high intensity, absence of glare and a minimum of disturbing shadows, it is now possible to meet all the visual requirements of daylighting, but while artificial illumination may be made the equal or even the superior of daylight in selected enterprises, such as department store work, it should not be inferred that all the beneficent purposes served by sunlight are met.

In discussing the possibility that windowless factories might cause claustrophobia among workers, or might predispose the workers to panic in case of air raids, *The Journal* declares: "Current comment on windowless air-conditioned work places implies that such structures are radically new. Overlooked is the fact that most theaters are windowless, ventilated or air-conditioned creations and that the counterpart of a windowless ventilated factory can be found in any mine. It is common experience that claustrophobia is not of common occurrence among theater patrons. On the other hand, few persons enter a mine or descend into a well without some anxiety. Certainly the mild apprehension which is the lot of most persons confronted with strikingly unusual physical surroundings cannot be regarded as significant. On moving into any new factory or office quarters of the windowless or opaque glass tile type of structure, fair numbers of all employees become more aware of air conditions, lighting and odors. Usually these mild states are transitory and unimportant. When the anxiety is severe or prolonged, adequate inquiry ordinarily will establish causative connections wholly unrelated to physical surroundings."

Regarding the effect of working in windowless factories on the sickness rate of employees, *The Journal* says that it is improbable that any significant disease conditions could be created by this type of architecture.

Safeguarding the Vision of the School Child.—Because of the intensive visual work done in the classroom, it is imperative that the physical arrangements of schools have provisions for safeguarding the sight of the pupils, Constance J. Foster states in *Hygeia*:

"The more exacting the eye work, as in drawing and sewing

classes, the more illumination is required for ease of seeing," she says. "Adjustable tilt-top desks help to bring work to the proper angle of vision. The desk should be high enough to prevent stooping or slumping. Work held 13 to 15 inches from the bridge of the nose is easiest on the eyes."

Discussing eye care during convalescence, she pointed out that "during convalescence from any prolonged or serious sickness, the eyes are weak and in need of special protection from strain. Yet this is the time when the child is frequently given books to read or amusements that require close visual application. It would be wiser to encourage periods of rest for the eyes by reading aloud to the child or providing him with projects that do not overtax the already weakened nerves and muscles of the eye."

Book Reviews

A TREATISE ON MEDICOLEGAL OPHTHALMOLOGY. Albert C. Snell.
St. Louis: C. V. Mosby Co., 1940. 300 p.

If there is a branch of medicine deserving of special medicolegal consideration it is ophthalmology and no one seems as well equipped as or better able to present this subject than Dr. Snell. Interest in the forensic aspect of ophthalmology in this country was given its first impetus by Dr. Harry Würdemann, who, at the turn of the century, made frequent contributions to literature on visual economics. Subsequently enactment of federal and state laws to provide compensation, in the event of industrial diseases or injuries, played a big part in the interest developed in the legal side of casualties involving the eyes.

Appraisal of the degree of disability sustained in these cases presents some complex problems in that it depends largely on how much of the functional loss sustained can be attributed to the accident to which it was ascribed. To compute the actual loss a knowledge of the visual acuity prior to the accident must necessarily be available. However, this is not always to be had, inasmuch as a large proportion of employers fail to have visual tests of new employees made and the visual acuity of all employees recorded at regular intervals, thus offering an important weakness in the line of medico-legal defense. But even with the data of the pre-existing visual acuity available, evaluation of ocular disability presents problems which often appear incomprehensible to jury and judge or even to the examining oculist.

For example, it is not readily comprehensible that the difference in visual acuity before and after injury, estimated by the Snellen type test, does not represent the actual efficiency loss and that many circumstances must be taken into account. It would seem evident that the same significance could not be attached to the total loss of one eye in those engaged in menial occupations as to those in whom binocular single vision is essential to their vocations, as in tennis and ball players. It is also conceivable that such cases

when it applies to actors, public speakers, and those whose occupation brings them before the public, the loss of the eyeball would have a greater compensatory significance than would the loss of vision alone.

Much interest attaches to the casualty cases in which permanent injury to one or more of the extrinsic ocular muscles has deprived the injured of binocular single vision, incapacitating him from work even though vision in each eye remained normal. Evaluation of the permanent disability for the purpose of indemnification in such cases offers a very difficult problem. This applies also to cases in which defects in peripheric vision follow head injuries and central retinal perception is retained.

Such medico-legal questions and many others are given full consideration by the author. An interesting and valuable chapter is also devoted to the malingerer and the means of detecting efforts at deception. The work of Snell is well classified and in a readable way furnishes information which should prove of interest and value to both physician and lawyer.

—ADOLPH O. PFINGST, M.D.

Briefer Comment

BOOKS FOR TIRED EYES—A LIST OF BOOKS IN LARGE PRINT. Compiled by Charlotte Matson and Dorothy Wurzburg. Chicago: American Library Association, 1940. 80 p.

This volume, a third edition, brings up to date the list of books for adults and books for children printed in 12-point type or larger. As the compilers say in the preface, it "cannot include all the excellent books printed in large type, nor does it pretend to be a list of best books. It represents, however, a variety of interesting readable books, now in print, set up in good clear type, and chosen with a due regard for the varying tastes of readers. It is gratifying to see that the tendency among publishers is to print many more books in large, clear type than they did when the first of these lists was compiled in 1923."

Current Publications on Sight Conservation

Note.—The National Society for the Prevention of Blindness presents the most recent additions to its stock of publications. Except for the more expensive ones, single copies are sent free upon request. Unless otherwise specified, they are reprinted from *THE SIGHT-SAVING REVIEW*. New publications will be announced quarterly.

351. Signs of Eye Trouble in Children. Two-color flyer listing behaviors that help discovery of visual difficulties. (75 cts. per C; \$5.00 per M.)

352. Helping America by Saving Sight in Childhood—Through Child Welfare Services, Helen C. Hubbell. 12 p. 10 cts. Describes sight conservation activities of the Child Welfare Division of the Pennsylvania State Department of Welfare.

353. Helping America by Saving Sight in Childhood—Through Educational Service, Winifred Hathaway. 16 p. 10 cts. Discusses the relation of social work to the sight-saving class program.

354. Planning an Individual Reading Program for a Child in a Sight-Saving Class, Margaret Balch. 16 p. 10 cts. Emphasizes the need to adapt the reading program to the individual needs of the sight-saving class pupil.

355. Eye Protection Experience in Mining Operations, R. H. Seip. 12 p. 10 cts. Outlines the program of eye conservation followed for fifteen years in a mining industry.

356. Saving of Eyes in Industry—A Management Problem, F. H. Humphreys. 8 p. 5 cts. Presents the part management plays in the development of an effective goggles program.

D143. Care of the Eyes and the Prevention of Blindness, U. S. Public Health Service. 4 p. (\$1.00 per C; \$7.50 per M.) Briefly outlines measures for protection and care of the eyes. Reprinted from *United States Health Reports*, August 9, 1940.

D144. Some Light on Lighting, Department of Agriculture. 4 p. (\$1.00 per C; \$7.50 per M.) Tips from experts on getting the most for your money in lighting. Reprinted from *Consumer's Guide* (U. S. Department of Agriculture), November 15, 1940.

Contributors to This Issue

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